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This institute focused on manufacturing industries for junior high industrial arts. It was attended by 20 teachers from 14 states who worked in four groups to develop pairs of instructional units titled "Introduction to Technology and Industrial Arts." Each of these units covers personnel management, engineering, production, finance, and marketing and was to be suitable for a "Laboratory of Industries" approach. Included were purposes, pupil activities, suggested content, and an evaluation unit. These units were tested on 60 boys and girls and video tapes were made and evaluated by the participants. (EM)

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Units for the
LABORATORY OF INDUSTRIES

Developed at an Institute
authorized under Title XI of NDEA
in cooperation with
U. S. Office of Education

July 1, 1968-August 9, 1968

Dr. John Mitchell
Institute Director

Department of Industrial Education and Technology

Gorham State College of the University of Maine
Gorham, Maine

August 1968

VT001844

INTRODUCTION

The efficient and effective implementation of a program of industrial arts reflective of industry and technology, especially in a "Laboratory of Industries" (Comprehensive General Shop) has been of major concern to both teachers and teacher educators. The procedures generally used have, in large measure, resulted in programs becoming too project-centered with little if any relationship to the overall objectives of industrial arts. Several methods have been used with varying degrees of success, but the true values and functions of the Laboratory of Industries have not, until recently, been recognized or realized.

The curriculum innovation in Maine, based upon the broad industrial classifications of Manufacturing, Construction, Power-Transportation, Electricity-Electronics, and Service has been made functional and operational through the unit method of organization and instruction. The unit, as used, has been defined "as a means of organizing instructional activities and materials into larger, related, and unified patterns of learning in order to achieve significant educational objectives." It usually provides a comprehensive coverage of a theme or problem, occupies more than one class period, includes a variety of learning activities and materials, and allows for cooperative teacher-pupil planning.

The unit method is simply one whereby the work of the semester or year is divided into a series of inter-related, flexible units, each having a unifying element or central theme toward which the activities or learning experiences are directed. In the Laboratory of Industries, the unit cuts across the arbitrary dividing lines which usually exist between subject areas, reduces to a minimum the piece-meal learning of unrelated, isolated skills or facts, and provides learning experiences in which the slow learner will find himself, on one hand, and the most gifted will be challenged on the other.

Spurred on by the success of this method in both junior and senior high schools in Maine, and by the need to reaffirm the role of the Laboratory of Industries, an NDEA Institute was proposed and held at Gorham State College. It concerned itself primarily with the Junior high school level and with the study of Manufacturing Industries.

Twenty general industrial arts teachers representing fourteen states from Maine to California participated in the Institute. During the first two weeks, they were oriented to newer educational developments, teaching methods, and unit organization. They were divided into four teaching teams and each then prepared a unit titled "Introduction to Technology and Industrial Arts." These were to be used during the three week practicum which followed and at which time they were to be evaluated.

Sixty pupils, boys and girls, who were to enter grades 7, 8, and 9 in the Gorham Schools volunteered to participate in the practicum. None had prior experience in industrial arts. They were divided into four heterogeneous classes by grade level, with two 8th grades. The classes met for an hour and twenty minutes daily, or the equivalent of three 40 minute periods per week for 15 weeks. Major portions of each class were video-taped to provide for subsequent evaluation.

While the first units were nearing completion, work was begun on the second units. Sufficient time was provided each team to view the video tapes and evaluate their work; to conduct research and develop their units; and to prepare lessons and teaching materials for the next class session. Each of the units was developed to serve both the purposes of the Institute practicum and the teacher's own situation. Consequently, they contain information, activities, and resources that can be used by junior high school teachers in any geographic area who are concerned with a study of manufacturing industries.

The selection of unit titles is based not only upon pupil interests but also on representative manufacturing industries. These provided the central or unifying themes. They may be retained or changed for those more appropriate to the interests of the pupils in the teacher's locale. However, the basic concepts or functions of manufacturing industries; namely, personnel management, engineering, production, finance, and marketing should be maintained. The degree to which understanding of these concepts will be acquired is reflected in the terminal behaviors, the activities provided, and the teacher's lessons which should be guided by the abilities or aptitudes of the pupils and the time limitations. It should be noted that only three objectives of industrial arts have been considered and analyzed. These are concerned with understandings, skills, and attitudes or appreciations. All other objectives are subsumed within these three.

The units used in the Institute practicum could not reflect the sequence possible inasmuch as none of the classes had prior experience. In the teacher's own school, succeeding units within each grade level should attempt to provide new experiences and increasing depths of information and skills so that a spiraling curriculum may evolve.

While the accompanying units were designed for a Laboratory of Industries, they may be readily adapted to single area type laboratories such as wood or metal industries, by limiting the study to the industry represented by the materials. The basic functions or concepts will remain the same but will concern themselves with the particular industry. The themes may be left unchanged but the manufactured products will be controlled by the material used.

Each unit is a complete teaching package containing purposes, pupil activities, approaches, instructional resources--including references, instructional aids and devices--suggested lessons and lesson content, and a final unit evaluation. Product plans and materials developed in and for the Institute are included and may be suggestive.

Recognition is given to Dr. James R. Hastings and his staff at Oswego State University College, New York, whose final report, "Field Study in Industry for the Preparation of Industrial Arts Teachers," provided significant materials which were either used or adapted for use in the units.

Special acknowledgment is given the Institute Staff, Dr. Arthur O. Berry, Asst. Director; John S. Greer, Full-time Instructor; and Messrs. Richard H. Carter and William C. Warren, Part-time Instructors, all of whom provided guidance and encouragement as each team's consultant.

A final tribute is given to each Institute participant who worked diligently and sincerely toward accomplishing the objectives of the Institute, and to the U. S. Office of Education which made it all possible.

Dr. John Mitchell, Director
August, 1968

TITLE OF UNIT

INTRODUCTION TO TECHNOLOGY AND INDUSTRIAL ARTS

TEACHING TEAM

EUGENE S. CHAPLIN
RICHARD O. GILPATRICK
JOHN KELLEY
DENNIS D. MAUST
FRANK W. REED

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

Technological development in the 20th century is proceeding at a rate of speed unheard of in the history of man. In America today, we depend upon technology to supply us with not only our basic needs, but all the luxuries we can demand of it. Although necessary to our way of life, this rapid development must be controlled, and to control it we must understand it. We can do this only by studying the environment within which it was created -- industry.

A historical study of American industry would reveal the need for technological advancement. An awareness of industry's role in creating and advancing technology must be an integral part of the educational development of our youth. Industry's influence is felt by everyone in our society and industrial arts, as a part of general education, has an obligation to provide a basic knowledge of industry to our youth. This knowledge must be imparted to pupils in order to better prepare them for the complexities of life.

SCOPE:

This unit will provide an introduction to industrial arts, industry and technology for junior high school pupils who have had no previous experience in this type of program.

This unit should be completed in one week of four single class periods or two double class periods. The unit may be adapted to all ability levels in the three grades of the junior high school.

OBJECTIVE 1: To develop an understanding of the meaning and purpose of industrial arts and its relationship to industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize industrial arts as a part of general education	1. a. Discuss correlation of industrial arts with other subject matter	Industrial Arts and General Education
2. Recognize the need for industry in our society	2. a. List local industries b. List articles of above c. Examine products and materials of local industries	The Role of Industry in our Society
3. Compare industrial arts with industry and technology	3. a. Make paper product b. Visit small industry c. Tour shop	The Relationship Between Industry, Industrial Arts and Technology

OBJECTIVE 2: To develop desirable attitudes towards the organization and operation of the industrial arts program

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize the need for proper conduct and safe practices in the industrial arts laboratory	1. a. Discuss rules for general safety in the laboratory b. View film	Safe Practices in the Industrial Arts Laboratory
2. Demonstrate a knowledge of the administrative practices of the industrial arts laboratory	2. a. Complete student contract form b. Discuss laboratory practices	Administration of the Industrial Arts Laboratory
3. Analyze the physical arrangement of an industrial arts laboratory	3. a. Participate in laboratory tour b. Discuss floor plan	Physical Arrangement of the Industrial Arts Laboratory

APPROACH:

1. Divide the pupils into groups and manufacture a simple product from paper. Using only a plain sheet of paper, they will be able to produce geometric designs -- animals, birds, airplanes, etc. This experience should assist in their gaining an understanding of "industry."
2. Arrange a display of materials and products of local industries.
3. Arrange a display of old and modern tools and use the chart "Tools That Created Civilization."
4. Exhibit pictures of industries and related material on the bulletin board.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Bethel, Lawrence, *Industrial Organization and Management*, New York: McGraw-Hill Publishing Company, 1962.

Gerbracht, Carl and Frank E. Robinson, *Understanding America's Industries*, Bloomington, Illinois: McKnight and McKnight, 1958.

Maine State Department of Education, *Industrial Arts Technology*, Augusta, Maine: The Department, 1965.

Olson, Delmar W., *Industrial Arts and Technology*, Englewood Cliffs, New Jersey: Prentice-Hall, 1965.

Silvius and Curry, *Teaching Successfully in Industrial Education*, Bloomington, Illinois: McKnight and McKnight, 1967.

United States Department of Labor, *Occupational Outlook Handbook*, Washington, D. C.: U. S. Government Printing Office, 1967.

RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Chart, *Tools That Created Civilization*, Wilkie Foundation, Des Plaines, Illinois

2. Strip film, *Basic Shop Safety*, Jam Handy Corporation, Detroit, Michigan, $5.00

3. Film, *The Factory*, University of Michigan, B & W, 13 mm., rental, Audio Visual Education Center, 416 4th Street, Ann Arbor, Michigan, $4.50

4. Manufactured articles from local industries

5. Information sheets
   a. Lab floor plan
   b. "Industrious Art" work sheet

6. Job application form

7. Time card

8. Floor plan transparency

Gorham State College
Department of Industrial Education
and Technology

Instr. A. O. Berry

FILM REPORT AND GUIDE SHEET

Title of film Factory: How a Product is Made

Type: B & W *(COLOR) * SOUND * SILENT
Size: (16 mm)* 35 mm Projection Time

Order From: Indiana University, Bloomington

University of Michigan, Ann Arbor

Cost of Loan Basis: $4.50
Film Classification: Skill * Occupational *(Industrial)* Scientific * Technical
Learning Level: 1-6; (7) - 8 - 9 - 10 - 11 - 12; technical high; vocational; college engineering

Reason for Showing: This film was shown to aid in developing an understanding of the purpose of Industrial Arts and its relationship to industry

Synopsis of Film: A simple toy is taken from the planning board, through steps of manufacture, to its sale in a retail store

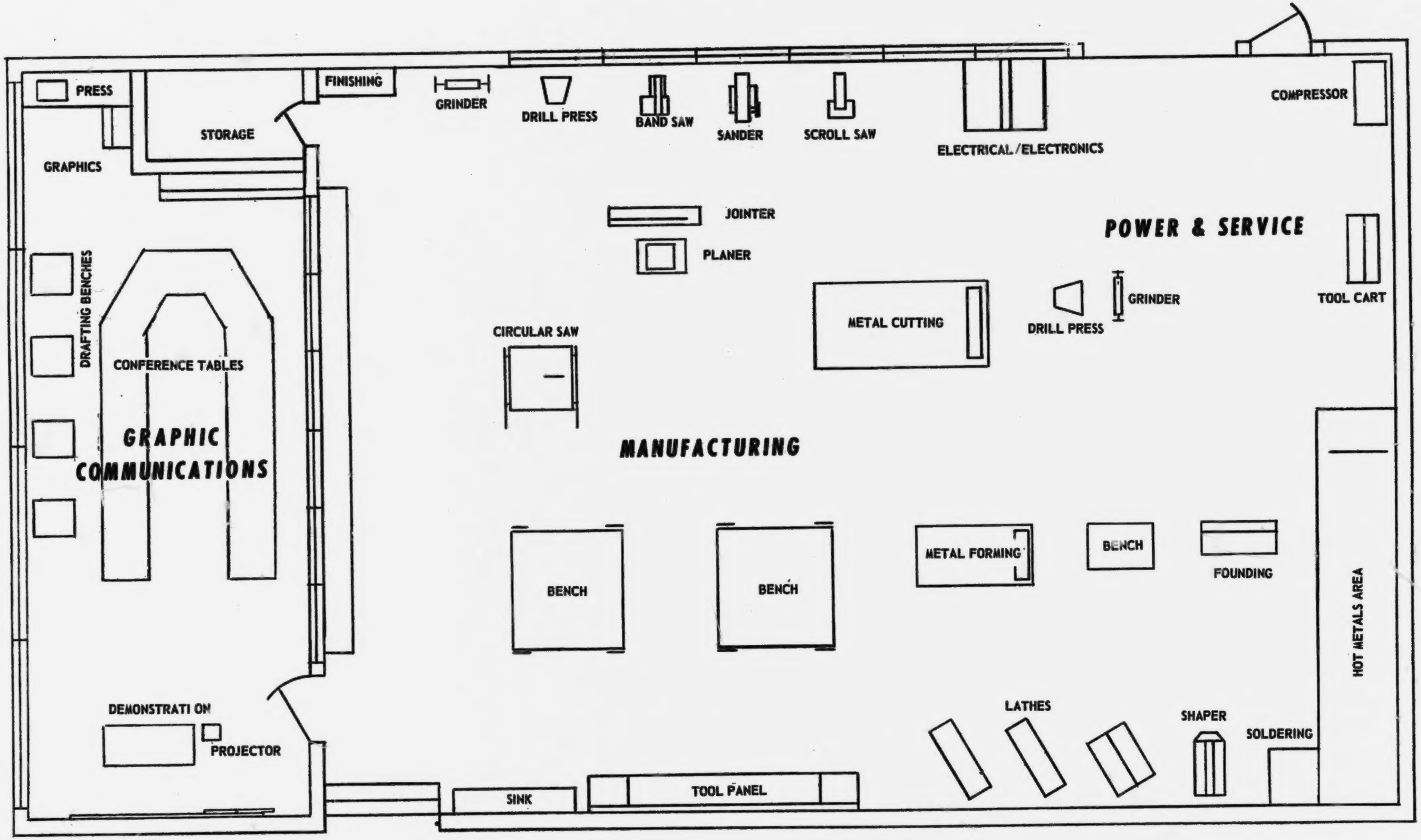
What to Look For: The steps industry takes to complete a product so that they can be related back to the Industrial Arts program

Evaluation and Comments:

	Excellent	Very Good	Good	Fair	Poor
1. Presentation (manner of)	X				
2. Timeliness (up to date)	X				
3. Accuracy (correct info)		X			
4. Clarity - Understanding	X				
5. Summarization	X				
6. Advertising (amount)	X				
7. Sound (clear, effective)			X		
8. Color (effective)		X			
9.					

Comments: (on back) -- Questions, comments, preview notes

Rev. 3/66


PRESS
STORAGE
FINISHING
GRINDER
DRILL PRESS
BAND SAW
SANDER
SCROLL SAW
ELECTRICAL/ELECTRONICS
COMPRESSOR
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CIRCULAR SAW
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CONFERENCE TABLES
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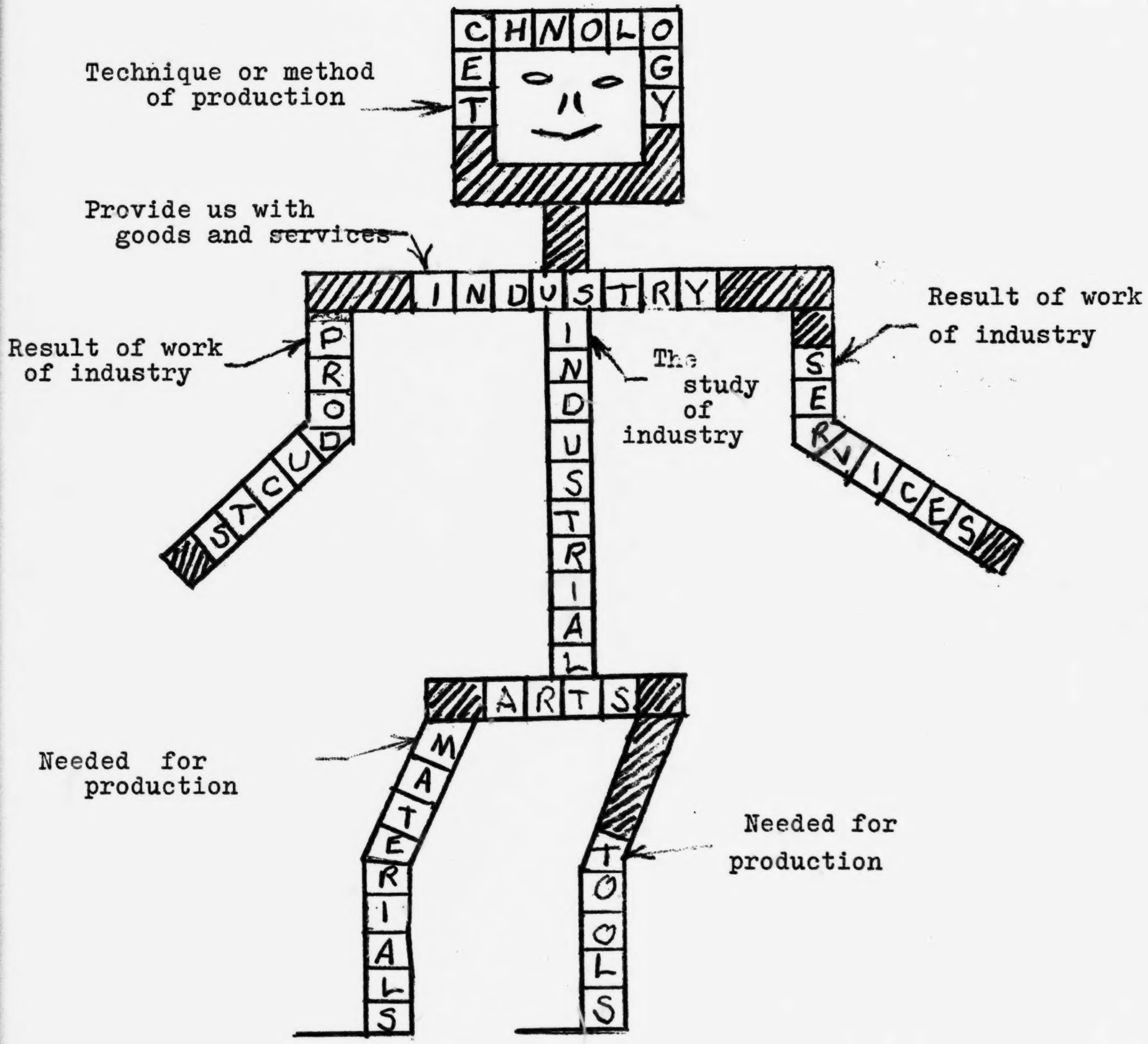
MANUFACTURING
BENCH
BENCH
METAL FORMING
BENCH
FOUNDING
HOT METALS AREA
DEMONSTRATION
PROJECTOR
LATHES
SHAPER
SOLDERING
SINK
TOOL PANEL

LABORATORY OF INDUSTRIES

GORHAM STATE COLLEGE

Put Muscles on Industrious 'Art'


TECHNOLOGY
INDUSTRY
PRODUCTS
SERVICES
INDUSTRIAL
ARTS
MATERIALS
TOOLS

Technique or method of production

Provide us with goods and services

Result of work of industry

The study of industry

Result of work of industry

Needed for production

Needed for production

JOB APPLICATION

Name of Employee________________________ Address______________

Age____ Sex: M___ F___ Phone______________

Father's Occupation______________________________________

Mother's Occupation______________________________________

List hobbies____

Work experience (tools, machinery, etc.)_________________

____

____

SAFETY RULES

1. Enter the room quietly and sit in assigned seat.
2. No horseplay while in the laboratory.
3. Use caution when handling tools.
4. Never leave the room without permission.
5. No running.
6. Wear proper safety apparel, such as aprons and safety glasses.

FIRE RULES AND REGULATIONS

In case of fire, leave the room by the door in the rear of the laboratory as quickly as possible. All employees must follow civil defense rules.

****

If employed, I agree to abide by the above regulations.

Signed______________________________

TIME CARD

NAME_______________

	WEEK OF		
	July 14	July 21	July 28
SUN.			
Mon.			
Tues.			
Wed.			
Thur.			
FRI.			
Sat.			

TOOLS AND EQUIPMENT:

1. Tools found in a typical industrial arts laboratory.
2. Overhead projector
3. Viewing screen
4. Movie projector
5. Film strip projector

MATERIALS AND SUPPLIES:

This being an introductory unit, no special materials and supplies are needed for its implementation.

LESSONS TO BE TAUGHT:

Industrial Arts and General Education

The Role of Industry in our Society

The Relationship Between Industry, Industrial Arts and Technology

Administration of the Industrial Arts Laboratory

Safe Practices in the Industrial Arts Laboratory

Physical Arrangement of an Industrial Arts Laboratory

Title: Industrial Arts and General Education

Presentation:

I. Introduce team to class

  A. Write names of team on chalkboard

  B. Have each team member stand as name is called

II. Read names of class members

  A. Have students stand and tell where they live

  B. Discussion

III. Ask what students expected when they signed up for course

  A. Call on individual students for response

  B. Discussion

IV. Show where industrial arts fits into broad field of general education

  A. Major subject areas

    1. Math
      a. Measurement
      b. Formulas
      c. Shapes
    2. Science
      a. Experiments
      b. Practical application
      c. Chemicals
    3. English
      a. Reading and writing
      b. Job application
      c. Communication
    4. Social studies
      a. Development of tools and machines
      b. Industrial Revolution

  B. Have students participate in discussion

Title: The Role of Industry in our Society

Presentation:

- I. Define industry
    - A. Industry is organization or society
    - B. Purpose is to produce goods and services
- II. Common types
    - A. Manufacturing
    - B. Construction
    - C. Service
- III. Needs of industry
    - A. Raw materials
    - B. Machines and tools
    - C. Money
    - D. People to work
    - E. Factories
- IV. Need for industries
    - A. Products and services
    - B. Jobs
    - C. Money

References:

Delmar W. Olson, Industrial Arts and Technology, pp. 61-66

Carl Gerbracht and Frank E. Robinson, Understanding America's Industries, pp. 2-5

Title: The Relationship Between Industry, Industrial Arts and Technology

Presentation:

- I. Define industry, industrial arts and technology
  - A. Produces goods and services
  - B. Study of industry
  - C. Technique or systematic method of production
- II. Industrial arts and industry
  - A. Place of industry in our society
  - B. Types of
  - C. Organization
  - D. Materials used
  - E. Products
  - F. Processes
- III. Technology and industry
  - A. Early history of industry
  - B. Mass production and automation of modern industries

References:

Lavon B. Smith and Marion E. Maddox, Elements of American Industry, pp. 256-259.

Title: Administration of the Industrial Arts Laboratory

Presentation:

- I. Student contract form
  - A. Explain job application
    - 1. Personal data
    - 2. Student competencies
  - B. Relate to industry
    - 1. How to fill out application
    - 2. Interview
- II. Time card
  - A. Attendance record
  - B. Relate to industry
- III. Identification card
  - A. Communication in laboratory
  - B. Department assignment
    - 1. Engineering
    - 2. Production
    - 3. Marketing
  - C. Relate to industry
    - 1. Entrance to plant
    - 2. Department identification
- IV. Assign student number and locker
  - A. Number
    - 1. Instruction seat
    - 2. Locker compartment
    - 3. Tool checks (if necessary)
  - B. Locker
    - 1. Apron
    - 2. Plans
    - 3. Materials

References:

Harold G. Silvius and Estell H. Curry, *Teaching Successfully in Industrial Education*, pp. 220-251.

Title: Safe Practices in the Laboratory

Presentation:

I. Why is safety important in our lives?

A. Safety on the highway

B. Safety in our homes

II. Safety in the industrial arts laboratory

A. Safety is really common sense

B. Personal habits

1. Attitude about safety
2. Clothing
   a. Remove sweaters
   b. Wear a shop apron
3. Keep hands clean
4. Always walk in the laboratory
5. Horseplay not tolerated, no fooling around
6. Report any injuries immediately

C. General safety rules

1. Avoid putting nails, etc., in the mouth
2. Leave vises in a closed position
3. Store products in a safe place
4. Keep oily rags in a covered metal container
5. Keep floors clean

D. Tool safety

1. Carry tools with the points down
2. Never put tools in your pocket
3. Hand tools to others by the handle first
4. Report broken or damaged tools to instructor
5. Wear safety glasses when working on dangerous tools or machines
6. Respect power machines and persons operating them

References:

Harold G. Silvius and Estell H. Curry, Teaching Successfully in Industrial Education, pp. 397-484.

Title: Physical Arrangement of an Industrial Arts Laboratory

Presentation:

I. Compare activities of classroom with those of laboratory

  A. Classroom

    1. Organize ourselves
    2. Decide on products
    3. Plan construction
    4. Terms: planning and designing

  B. Laboratory

    1. Make products
    2. Term: manufacture

II. Point out location of materials and supplies

  A. Wood, metal, plastics and leather

  B. Nuts, bolts, wood screws, washers, etc.

III. Illustrate factors affecting laboratory arrangement

  A. Convenience

  B. Safety

IV. Point out section of laboratory where pupils will carry on most of their activities

  A. General purpose benches

  B. Tool panel - hand tools

V. Describe laboratory as a place of vast activities

  A. Many materials used

  B. Many operations carried on

References:

Maine State Department of Education, Industrial Arts Technology, pp. 10-17.

TITLE OF UNIT

THE PERSONAL ACCESSORIES MANUFACTURING INDUSTRIES

TEACHING TEAM

EUGENE S. CHAPLIN
RICHARD O. GILPATRICK
JOHN E. KELLY
DENNIS D. MAUST
FRANK W. REED

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

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INTRODUCTION:

Never satisfied with things as they are, humans have labored ceaselessly to ornament their homes, their furniture, their garden plots, and their own person. The desire for handsome rings, pins, bracelets, necklaces, wallets, handbags, coil purses and other forms of personal accessories is common to all people in all lands and all eras.

This desire of people is emphasized by the fact that more than 25,000 persons were employed in jewelry sales and repairs and related industries in the United States during 1965. This and other areas, such as leather, metal, wood and plastic accessories and novelties production, is satisfying the need for people to adorn themselves and provide gifts for others.

The industry may be of corporation size, but more often it is a single ownership or partnership type of organization. A study of this industry provides the pupil with the opportunity to experience all the basic functions of the major manufacturing industries.

The interests of the beginning industrial arts pupil have very definite leanings toward the personal item for himself or as a gift for a relative or friend. Pupils at this level also have a limited interest span. Therefore, the small personal accessory will provide for adequate learning of skills and attitudes necessary in industrial arts and general education. Through a strong pupil interest factor, it will be possible to develop basic understandings and appreciations concerning the broad field of manufacturing and industrial technology as we know it today.

SCOPE:

This unit is designed for seventh grade students who have had no previous experience in industrial arts. The length of the unit would be five to six weeks, forty-five minutes in length, and five periods per week. This unit, with minor modification, could be adapted to any ability level. The major emphasis is on single ownership and custom production.

OBJECTIVE 1: To develop an insight to and an understanding of the personal accessories industries and its place in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize various products of the personal accessories industry and materials used	1. a. List various products of the personal accessories industry b. Research catalogues, magazines, and newspapers for product ideas	The Personal Accessories Industry and its Place in Our Society
2. Recognize the need for the industry in our society	2. a. Discuss job opportunities and occupations b. Visit gift shops, novelty stores, jewelry stores, etc. c. Discuss custom of giving gifts	
3. Recognize the scope of the industry	3. a. State hobbies that are concerned with personal accessories	

OBJECTIVE 1: To develop an insight to and an understanding of the personl accessories industries and its place in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	3. b. Discuss personal accessories for profit making (small and large businesses)	
4. Relate the function of industry to the Industrial Arts laboratory	4. a. Construct a chart of the functions of industry	The Functions of Industry
	b. Visit an industry and analyze the product manufacturing sequence	

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Follow a logical procedure in selecting a personal accessory	1. a. Describe procedures used in selecting a product	Market Research and Product Development
	b. Bring in product ideas	
	c. Select product	
2. Apply principles of design to a personal accessory	2. a. Bring design samples to class	Industrial Forms of Design
	b. Examine products for various design ideas	
	c. Develop a design for a personal accessory	
3. Select materials best suited for his design	3. a. Inspect various materials	Materials Procurement and Control
	b. List material on production plan	

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
4. Organize a production guide using the functions of industry	4. a. Analyze a product for manufacturing processes	How to Prepare an Industrial Production Guide
	b. Make out an industrial production guide	
5. Recognize and use basic layout tools	5. a. Make list of layout tools they will use	How to Layout on Flat Stock
	b. Layout design on material	
6. Recognize and use basic cutting tools	6. a. Identify cutting tools	How to Cut Flat Stock
	b. Cut out design on material	
7. Recognize and use basic shaping tools	7. a. View demonstration on shaping.	How to Shape Flat Stock
	b. Shape material	

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
8. Recognize and use basic forming tools	8. a. Experiment with forming tools on materials	How to Form Flat Stock
	b. Form material	
9. Recognize and use basic assembly tools and materials	9. a. Assemble product	How to Use Assembly Tools and Materials
	b. Test bonding materials for strength	
10. Recognize and use basic finishing materials and tools	10. a. Experiment with sample finishes	Finishing Methods and Tools Used in the Manufacture of Personal Accessories
	b. Finish product	How to Copper Enamel
11. Recognize the need for proper packaging and labeling of a product	11. a. Make a card, slip or box for packaging a personal accessory	Packaging Products in the Personal Accessories Industry
	b. Package personal accessory	

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to: 12. Recognize the importance of marketing and pricing in the personal accessories industry	Have pupils: 12. a. Prepare a sample advertising poster b. Give a commercial to the class	Pricing and Marketing Techniques Used in the Personal Accessories Industry

OBJECTIVE 3: To develop desirable attitudes toward the worker and the products of the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Demonstrate safe work habits.	1. Use tools and materials with a reasonable degree of safety	
2. Function adequately as a member of an organized group	2. a. Take part in personnel organization	Industrial Organization and Management
	b. Work with other pupils in the laboratory	
3. Show desirable attitudes in the use, care and construction of personal accessories		

APPROACH:

1. Have pupils survey books, magazines, catalogs, and other materials to compile a list of personal accessories.
2. Arrange a display of types of common personal accessories.
3. Arrange a field trip to a gift shop, jewelry store, or handicraft or hobby store.
4. Invite a representative of a jewelry and novelty industry to speak to the group.
5. Have students discuss what personal accessory he or she could use.
6. Have students state what personal accessories their brothers and sisters, as well as their mother and father possess.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

American Handicrafts Company, *Clear Cast Instructor's Manual*, Fort Work, Texas, 1968.

American Handicrafts Company, *Instructor's Manual*, Fort Worth, Texas, 1967.

Amrine, Harold T.; Ritchey, John A.; Hulley, Oliver S., *Manufacturing Organization and Management*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966.

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Zimmerman, Fred W., Leathercraft, Chicago: Goodheart Willcox Company, Inc., 1961.

RESOURCE MATERIALS:

A. TEACHING AIDS AND DEVICES

1. Information sheets

   a. Typical products of the Personal Accessories Industry
   b. Stock price list
   c. Purchase requisition form
   d. Personnel organization job requirements
   e. Personnel organization chart
   f. Links of industry
   g. Industrial production guide
   h. Functions of industry chart

2. Information sheets used for overhead transparency

   a. Abrasive particles
   b. Line organization chart
   c. Line and staff organization chart
   d. General procurement procedures
   e. Material acquisition and recording procedures
   f. Levels of management chart
   g. Levels and flow of authority
   h. Marketing interrelationship

TYPICAL PRODUCTS
OF THE
PERSONAL ACCESSORIES INDUSTRY

Woods

- Pins
- Earrings
- Bracelets
- Name plate
- Laminated pendants

Metals

- Copper enameled
  - Earrings
  - Pins
  - Tie clasp
  - Rings (planished)
  - Bracelet (planished)

Plastics

- Earrings
- Bracelets
- Zipper pulls
- Rings
- Tie clasps
- Pins
- Key tags
- Name plates

Leather

- Coin purse
- Keycase
- Comb case
- Earrings
- Cuff links
- Belts
- Head bands
- Pony tail harness

Name________________________

MARKET SURVEY

AREA (wood, metal, etc.)	PRODUCT

PERSONAL ACCESSORIES INDUSTRY

STOCK PRICE LIST

Material	Price per Square Inch
Metals	
Aluminum	
Copper	
Plastic	
Sheet	
Liquid cast	
Leather	
Wood	
Pine	
Mahogany	
Walnut	
Bead Chain	
Pin	

PERSONAL ACCESSORIES INDUSTRY

PURCHASE REQUISITION

Department_______________________
Requisition Number_______________
Date_____________________________
Requested by_____________________
Approved by______________________
Checked by_______________________
Please provide the following:
Date material is needed________________

QUANTITY	DESCRIPTION Size, color, material	Number of units	Unit Cost	Total Cost
Purchased Parts				

Instructions:

PERSONAL ACCESSORIES INDUSTRY

PERSONNEL ORGANIZATION JOB REQUIREMENTS

General Manager:

1. Signal end of work period.
2. Supervise personnel in laboratory clean-up.
3. Assign work of substitutes.
4. Report to instructor when all is complete.

Foremen:

1. Supervise assigned area.
2. Assist personnel as needed.
3. Report to general manager when personnel have finished.

Sweepers:

1. Sweep all floor areas.
2. Pick up and dispose of waste.
3. Report to foreman.

Benches:

1. Clean all benches.
2. Replace materials in proper storage.
3. Report to foreman.

Tools:

1. Return all tools to panels.
2. Dust tools and panels.
3. Report to foreman.

Substitutes:

1. Take place of absentees as assigned by general manager.
2. Do assigned job if no one is absent.

Conference Room:

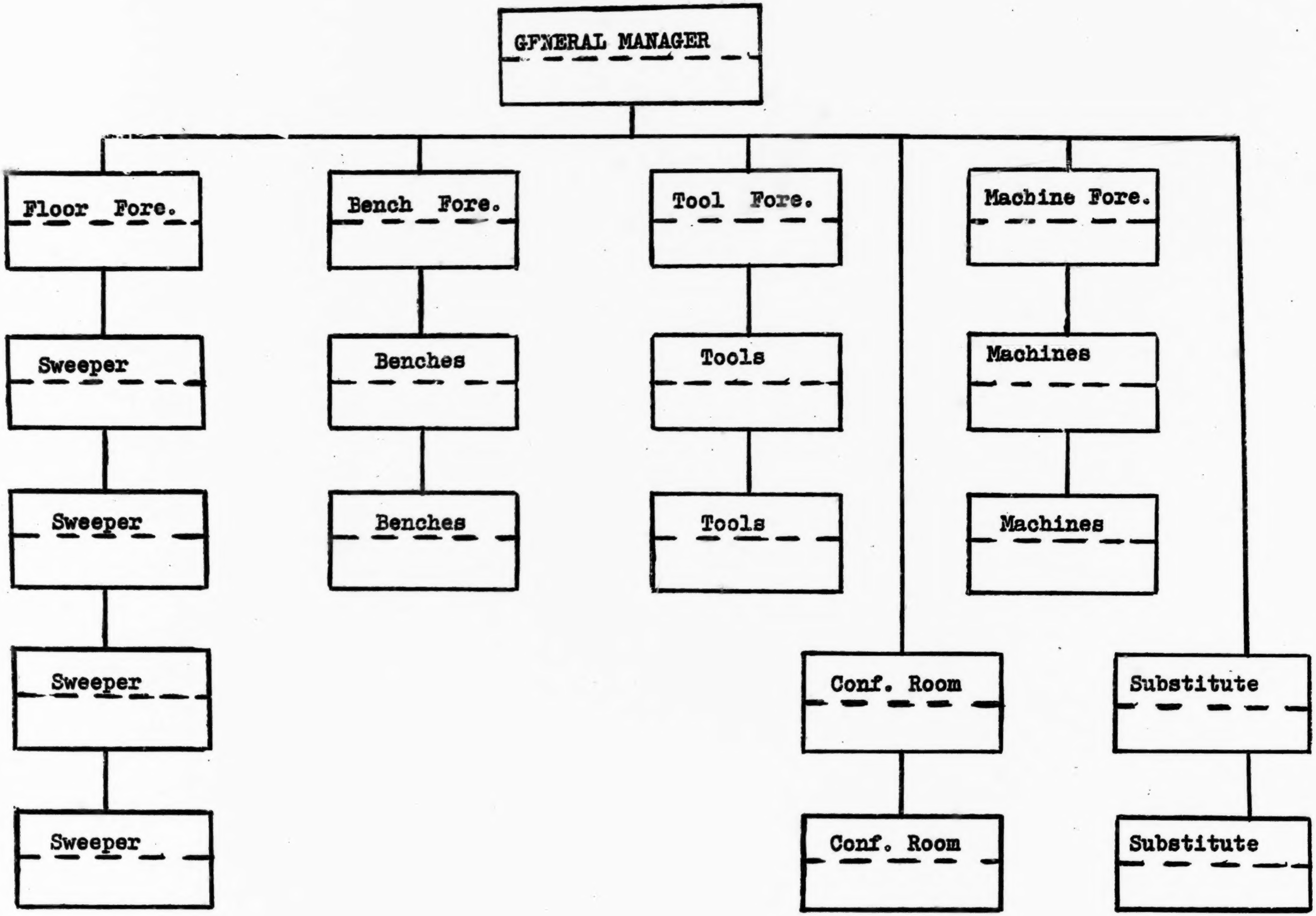
1. Pick up work tables.
2. Arrange chairs and tables.
3. Clean chalkboard.
4. Report to general manager.

ORGANIZATION IS NECESSARY IF INDUSTRY IS TO FUNCTION PROPERLY.

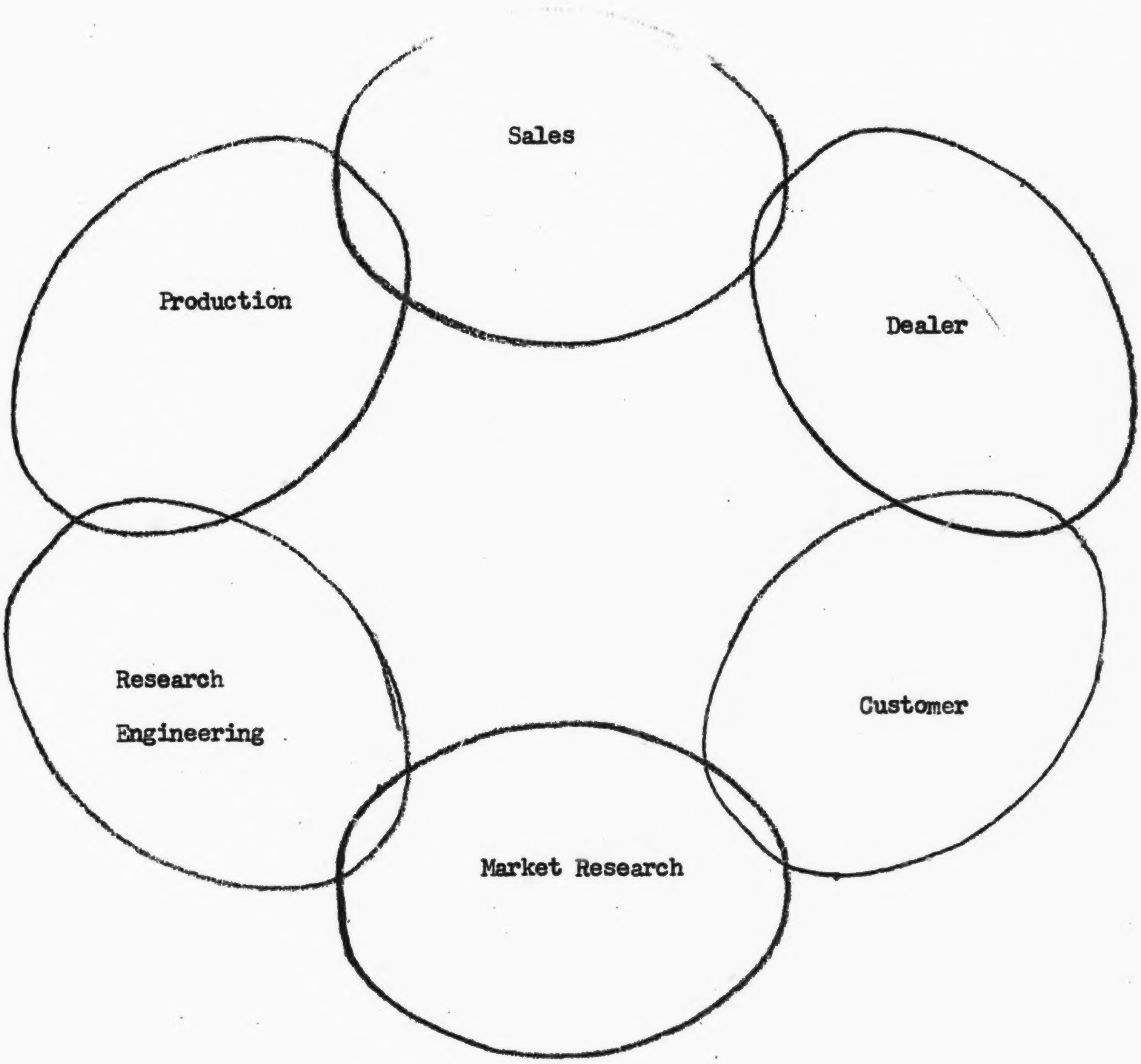
THIS ORGANIZATION WILL FUNCTION AND BE SUCCESSFUL IF EACH MEMBER DOES HIS BEST.

Personal Accessories Industry

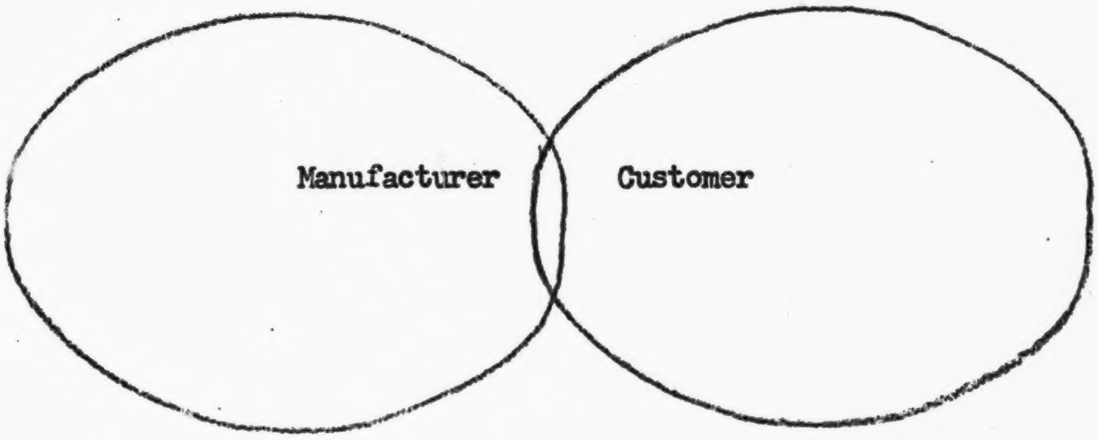
PERSONNEL ORGANIZATION


GENERAL MANAGER
Floor Fore.
Sweeper
Sweeper
Sweeper
Sweeper
Bench Fore.
Benches
Benches
Tool Fore.
Tools
Tools
Machine Fore.
Machines
Machines
Conf. Room
Conf. Room
Substitute
Substitute

TEACHING AID
Links of Industry


Sales
Production
Dealer
Research
Engineering
Customer
Market Research

Large Industry

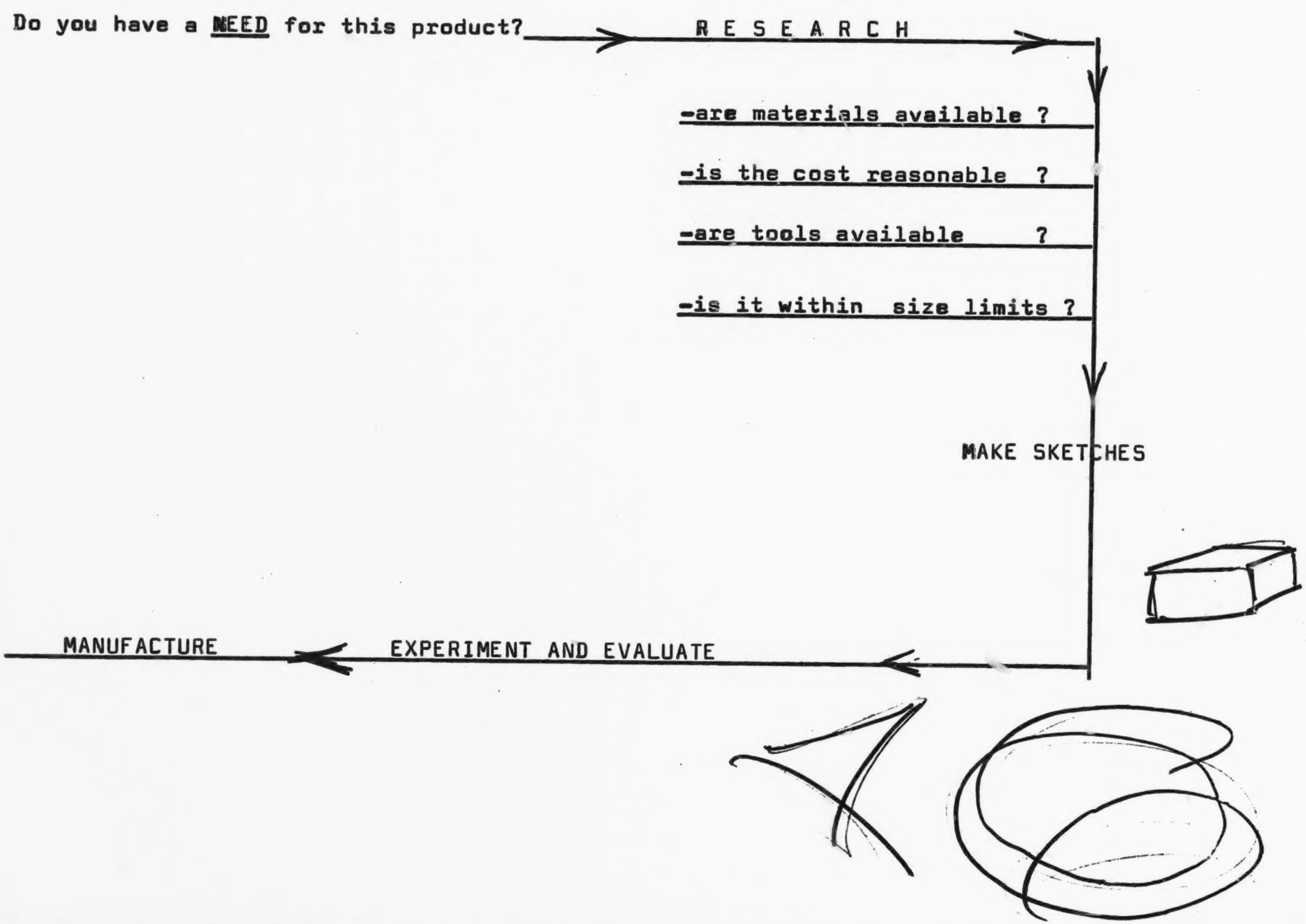

Manufacturer
Customer

Lawrence L. Bethal, Franklin S. Atwater, Industrial Organization and Management

INDUSTRIAL DESIGNING PROCESS

Name ____________________

Product name ____________________


Do you have a NEED for this product?
R E S E A R C H
-are materials available ?
-is the cost reasonable ?
-are tools available ?
-is it within size limits ?
MAKE SKETCHES
EXPERIMENT AND EVALUATE
MANUFACTURE

Industrial Production Guide

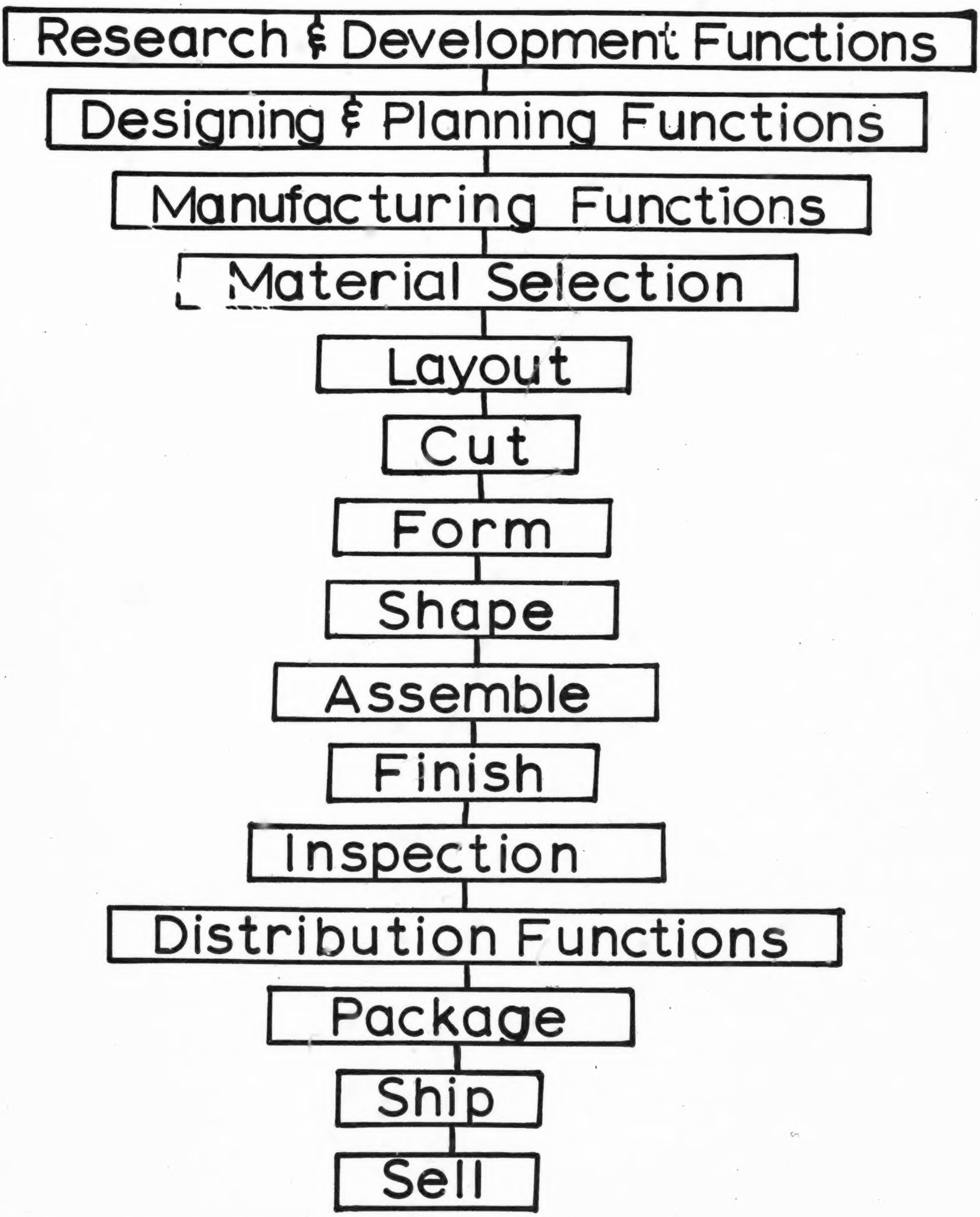
Name:

Article to be produced: Number:

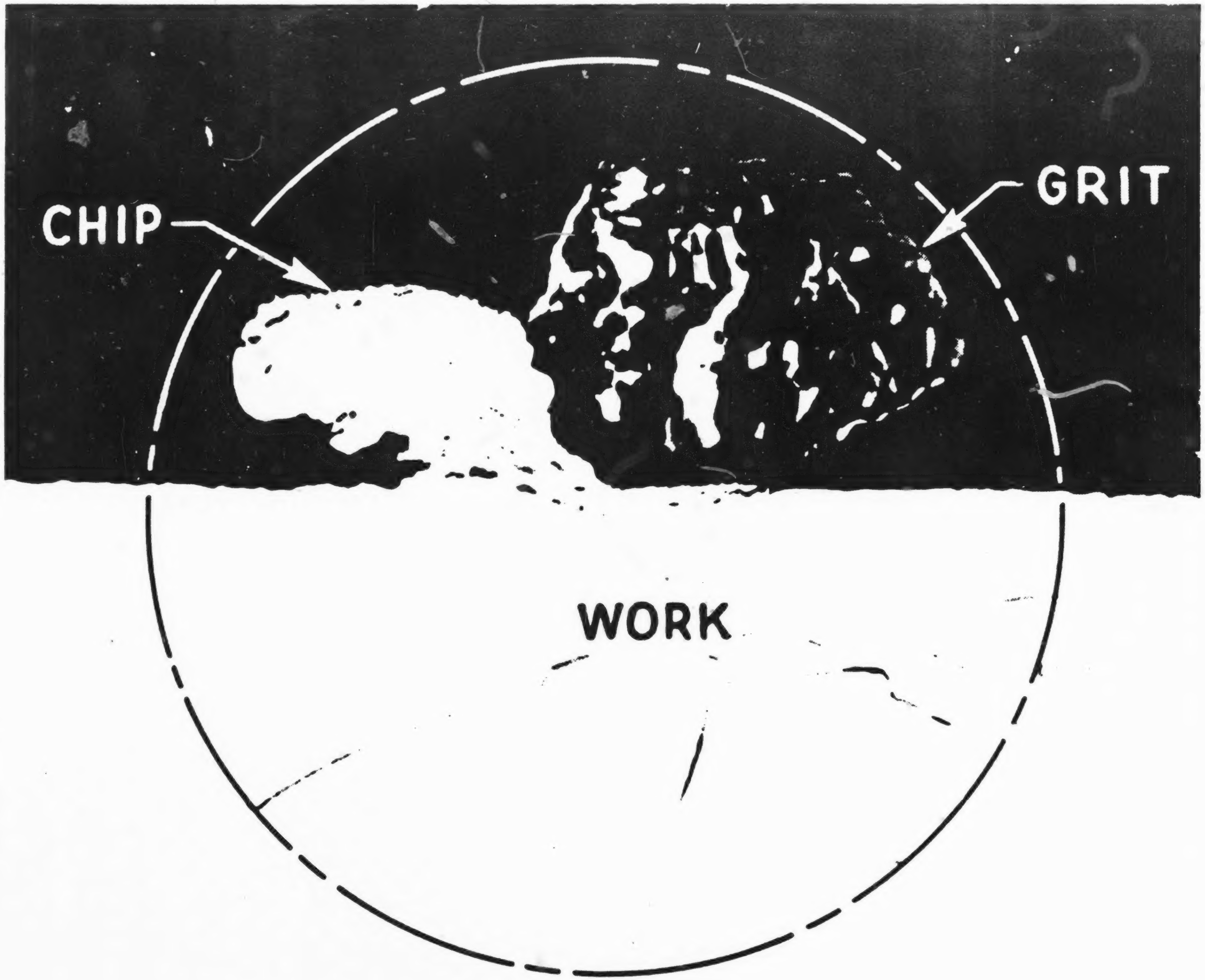
Date Begun: Date Finished: Time Elapsed (hours):

Estimated Cost: Approval to Start:

PRODUCTION STEPS	Pictorial Sketch
1. Make working drawing.	
2. Make out bill of materials.	
3. Make out Production Guide.	

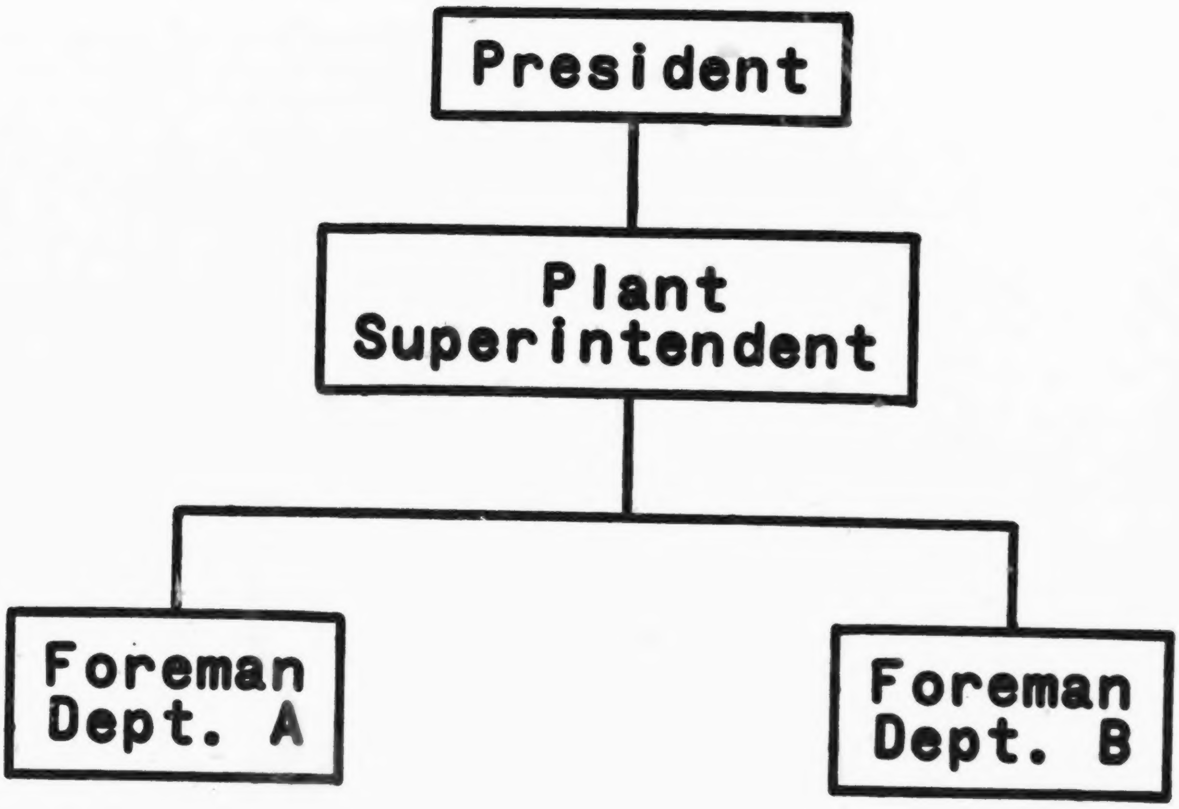

Research & Development Functions
Designing & Planning Functions
Manufacturing Functions
Material Selection
Layout
Cut
Form
Shape
Assemble
Finish
Inspection
Distribution Functions
Package
Ship
Sell

State of Maine Department of Education, Industrial Arts Technology, P.1.


CHIP
GRIT
WORK

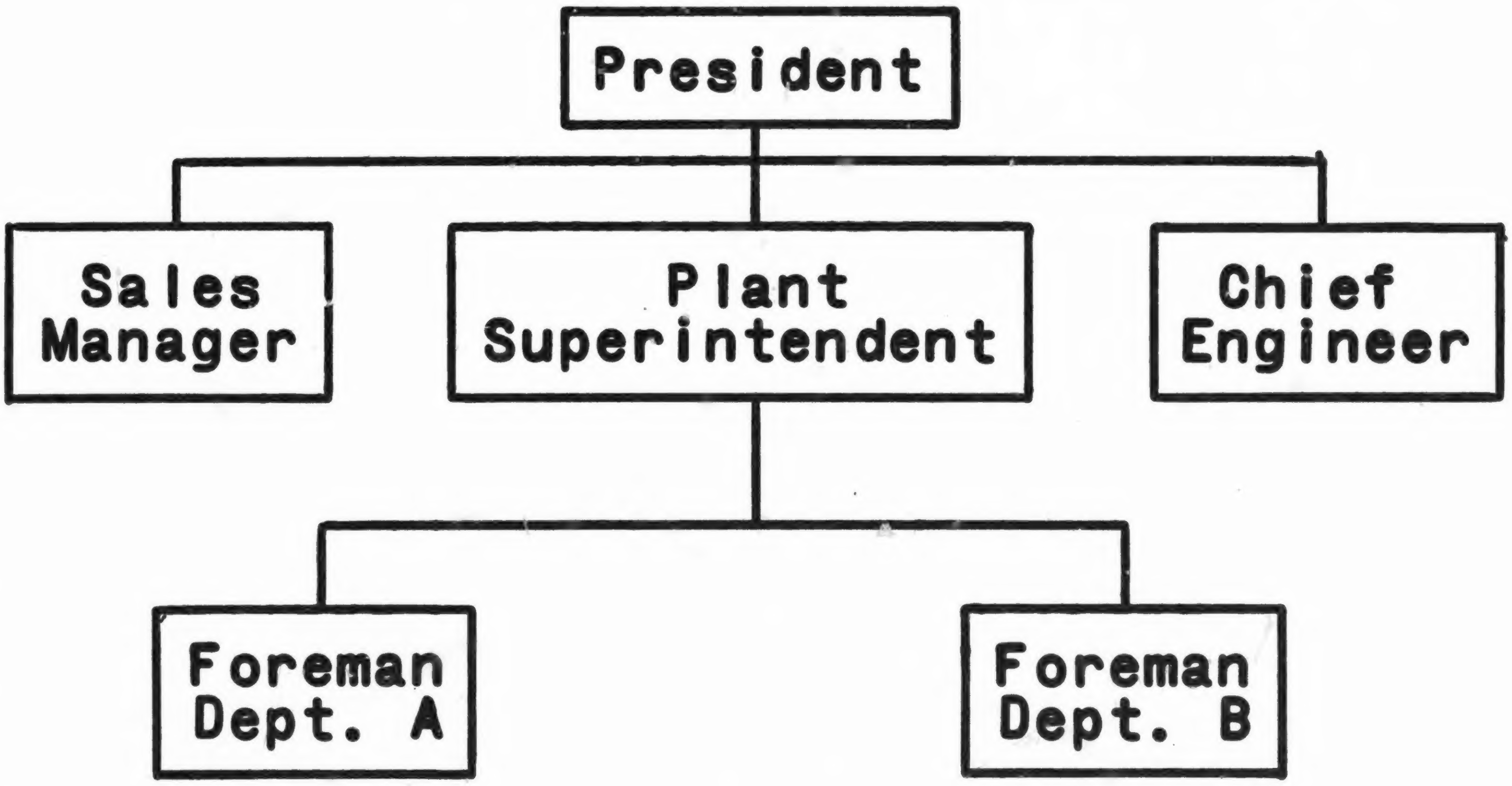
Ludwig, O. A., Metal Work Technology and Practice, P. 401.

LINE ORGANIZATION


President
Plant Superintendent
Foreman Dept. A
Foreman Dept. B

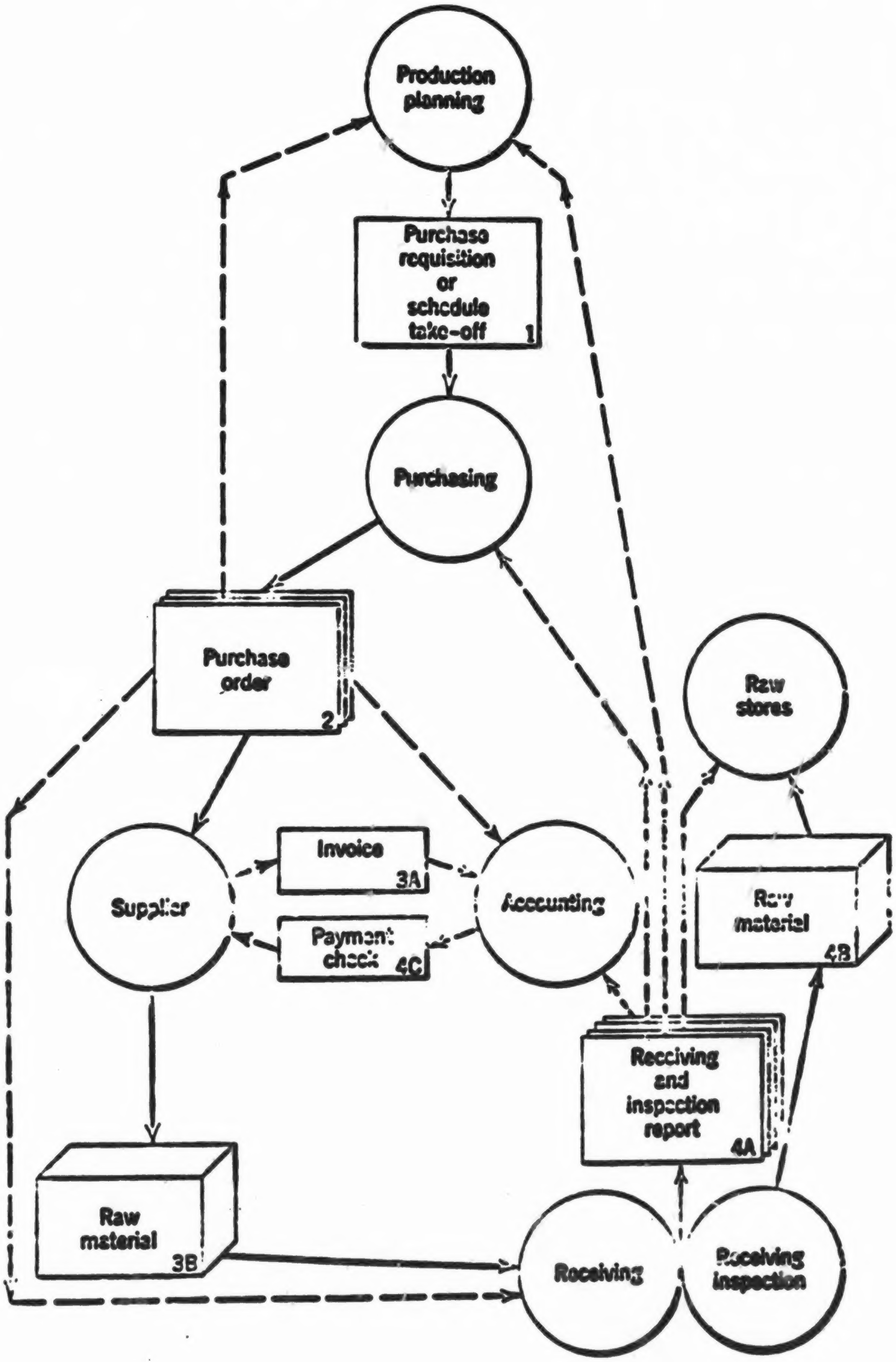
AMRINE AND OTHERS, *MANUFACTURING ORGANIZATION AND MANAGEMENT*, P. 34.

LINE AND STAFF ORGANIZATION


President
Sales Manager
Plant Superintendent
Chief Engineer
Foreman Dept. A
Foreman Dept. B

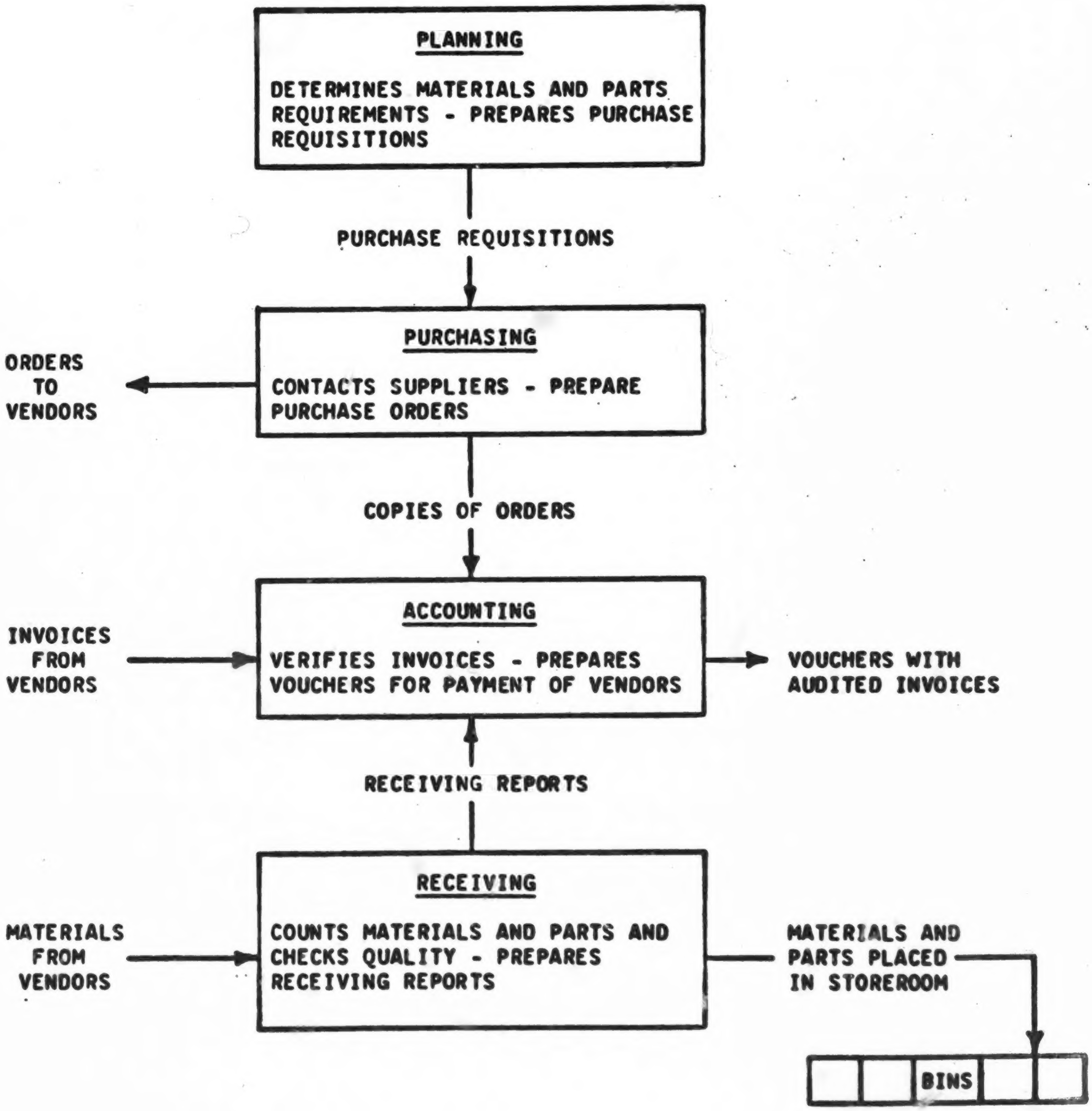
AMRINE AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 55.

GENERAL PROCUREMENT PROCEDURE


Production planning
Purchase requisition or schedule take-off
1
Purchasing
Purchase order
2
Raw stores
Supplier
Invoice
3A
Accounting
Payment check
4C
Raw material
4B
Receiving and inspection report
4A
Raw material
3B
Receiving
Receiving inspection

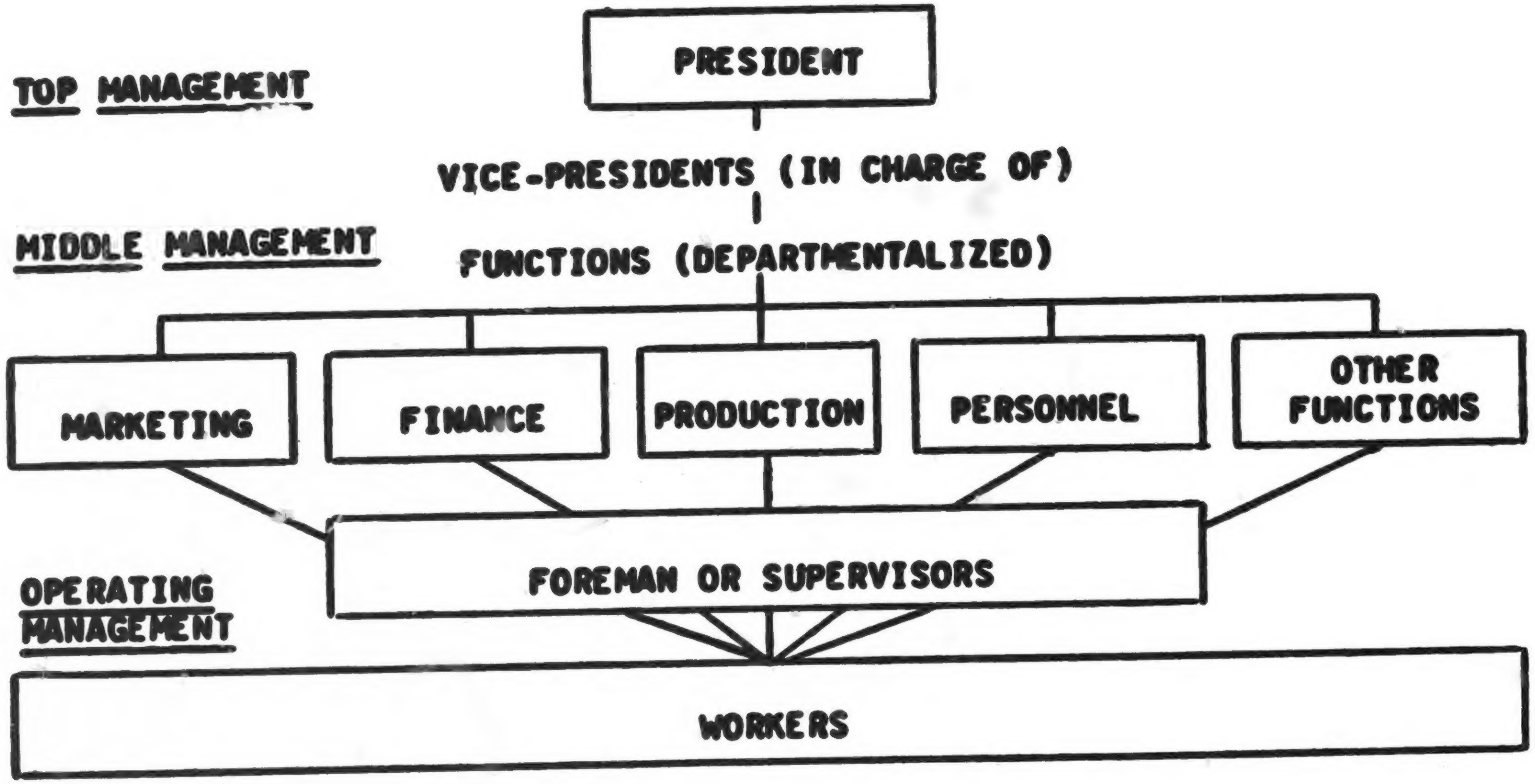
MACNIECE, PRODUCTION, FORECASTING PLANNING, AND CONTROL, P. 183.

MATERIAL ACQUISITION
and
RECORDING PROCEDURE


PLANNING
DETERMINES MATERIALS AND PARTS REQUIREMENTS - PREPARES PURCHASE REQUISITIONS
PURCHASE REQUISITIONS
PURCHASING
CONTACTS SUPPLIERS - PREPARE PURCHASE ORDERS
ORDERS TO VENDORS
COPIES OF ORDERS
ACCOUNTING
INVOICES FROM VENDORS
VERIFIES INVOICES - PREPARES VOUCHERS FOR PAYMENT OF VENDORS
VOUCHERS WITH AUDITED INVOICES
RECEIVING REPORTS
RECEIVING
MATERIALS FROM VENDORS
COUNTS MATERIALS AND PARTS AND CHECKS QUALITY - PREPARES RECEIVING REPORTS
MATERIALS AND PARTS PLACED IN STOREROOM
BINS

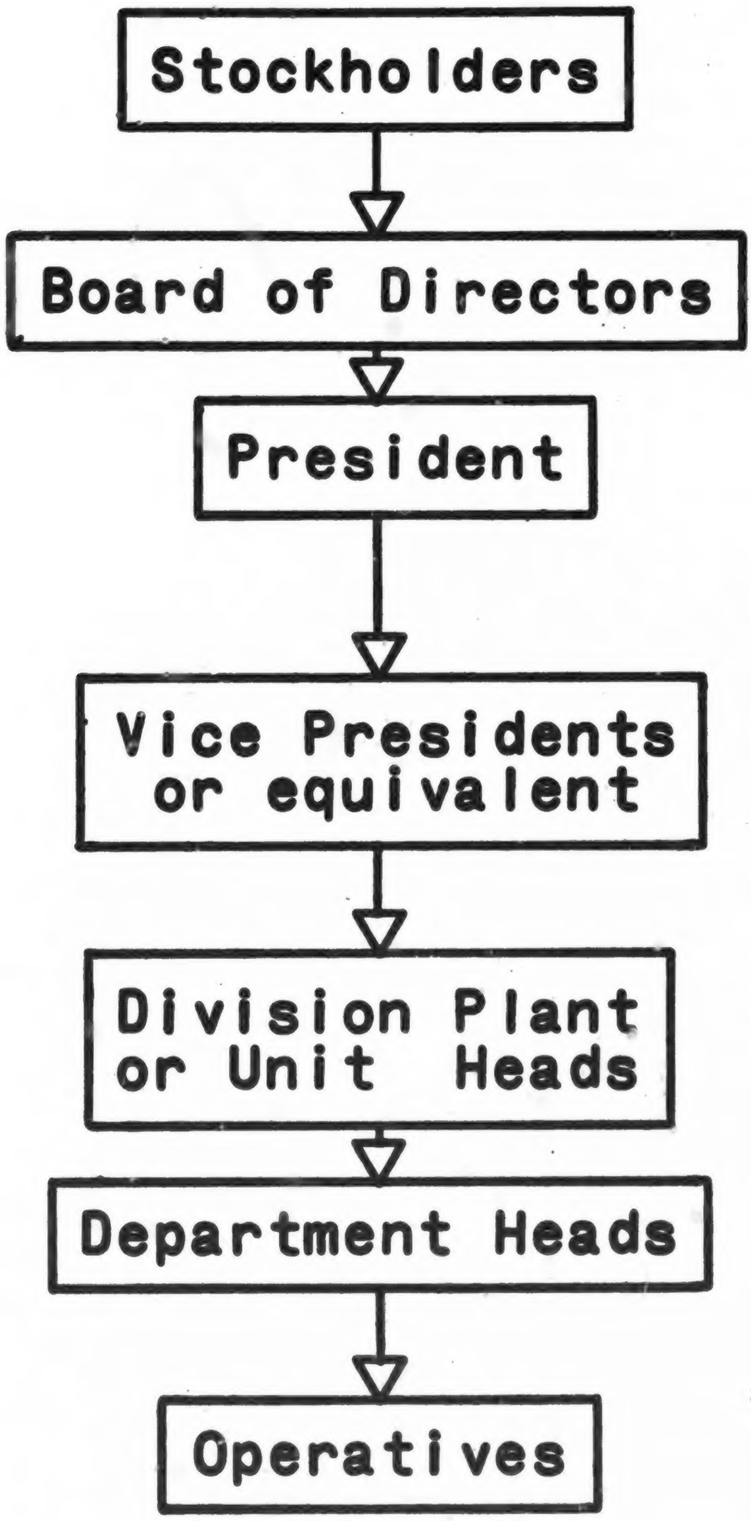
Brummet, R. Lee. *Cost Accounting for Small Manufacturers*. Washington, Small Business Administration, 1953.

LEVELS OF MANAGEMENT


TOP MANAGEMENT
PRESIDENT
VICE-PRESIDENTS (IN CHARGE OF)
MIDDLE MANAGEMENT
FUNCTIONS (DEPARTMENTALIZED)
MARKETING
FINANCE
PRODUCTION
PERSONNEL
OTHER FUNCTIONS
OPERATING MANAGEMENT
FOREMAN OR SUPERVISORS
WORKERS

WHEELER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 142.

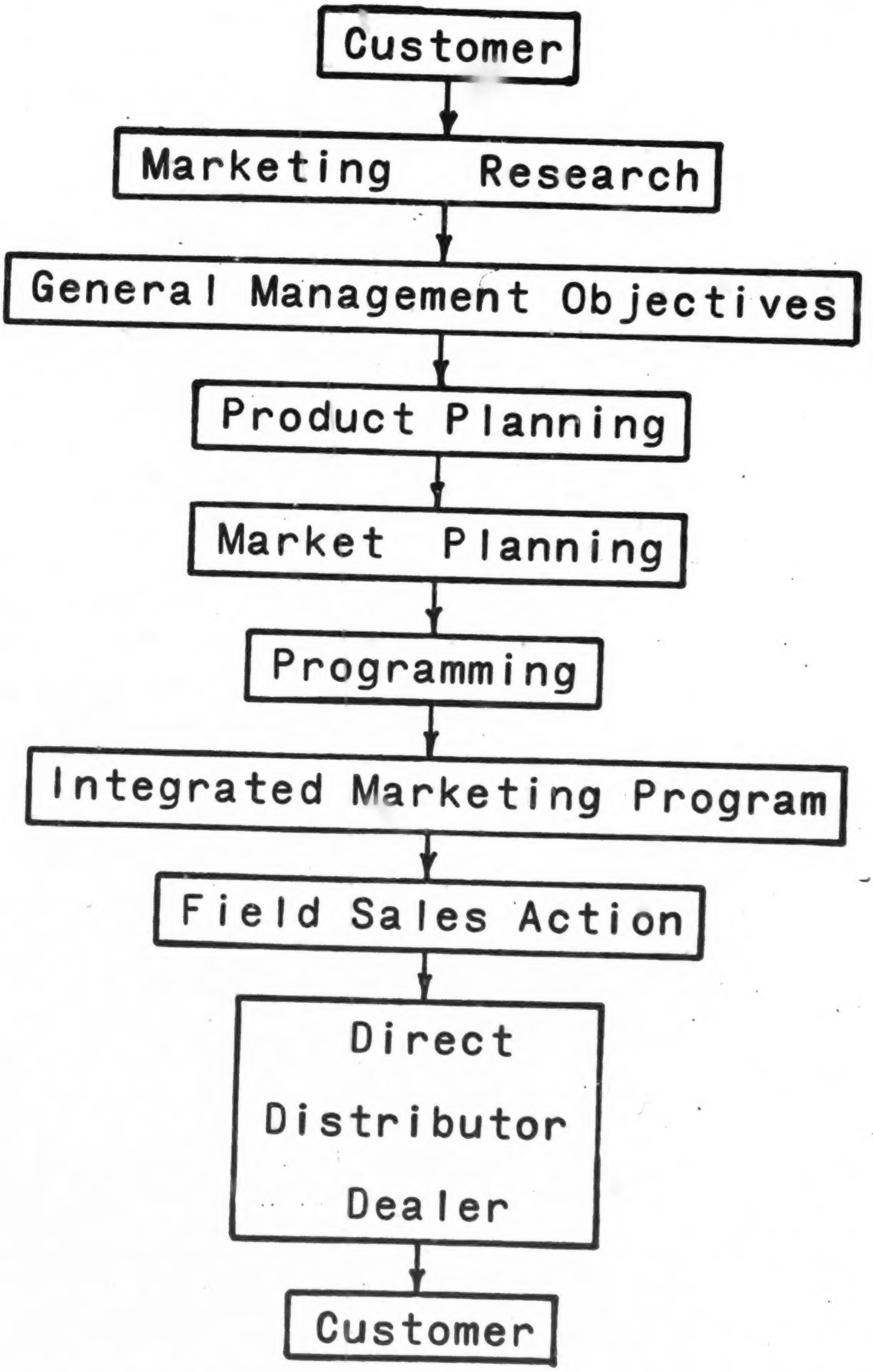
LEVELS AND FLOW OF AUTHORITY



Ultimate authority and control	Stockholders
Policy Formation	Board of Directors
Immediate and effective authority and control	President
Geographic and functional activity and control	Vice Presidents or equivalent
Integration of operations	Division Plant or Unit Heads
Supervision of operations	Department Heads
Performance of operations	Operatives

WHEELER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 144.

MARKETING INTER-RELATIONSHIPS


Customer
Marketing Research
General Management Objectives
Product Planning
Market Planning
Programming
Integrated Marketing Program
Field Sales Action
Direct
Distributor
Dealer
Customer

MESSNER, INDUSTRIAL ADVERTISING, P. 31.

TOOLS AND EQUIPMENT:

The manufacture of personal accessories in the general industrial arts laboratory will require the tools and equipment commonly needed for work with woods, metals, plastics and leather.

Special equipment which may be added to provide greater depth is listed below:

1. Small oven (heating and forming plastics)
2. Kiln (copper enameling)
3. Buffing wheel for metals and plastics
4. Carving tools
5. Woodburning tools
6. Molds for plastic casting

MATERIALS AND SUPPLIES:

Those materials commonly available in the general industrial arts laboratory are necessary for the manufacture of personal accessories. The following is a suggested list for the development of the unit:

Leather Products

Cow hide, calf skin, lacings, belt buckles, snaps, rivets, key case studs, key case hooks, eyelets, wax and finishes

Plastic Products

Acrylic plastic (variety of colors and thicknesses), casting resin, extruded forms, bead chain, pin backs, tie clasps, cement, dyes, abrasives

Wood Products

Variety of hard and soft woods, glue, abrasives, metal findings, wood finishes

Metal Products

Sheet copper, alunimum, brass, metal findings, (glaze for enameling), abrasives, finishes

LESSONS TO BE TAUGHT:

The Personal Accessories Industry and its Place in our Society

The Functions of Industry

Market Research and Product Development

Industrial Forms of Design

How to Prepare an Industrial Production Guide

Materials Procurement and Control

Industrial Organization and Management

How to Layout on Flat Stock

How to Cut Flat Stock

How to Shape Flat Stock

How to Form Flat Stock

How to Use Assembly Tools and Materials

Finishing Methods and Tools Used in the Manufacturing of Personal Accessories

How to Copper Enamel

Packaging Products in the Personal Accessories Industries

Pricing and Marketing Techniques Used in the Personal Accessories Industry

Title: The Personal Accessories Industry and its Place in our Society

Presentation:

I. Acquaint pupils with personal accessories

  A. Display various products

    1. Pins (wood)
    2. Zipper pulls (plastic)
    3. Bracelets (metal)
    4. Key cases (leather)

  B. Provide research material

  C. Make list of various accessories

II. The need for the personal accessories industry

  A. Job opportunities

  B. Personal adornment

  C. Gift giving

III. Scope of the industry

  A. Individual ownership

    1. Home workshop
    2. Small knick-knack shop

  B. Partnership

  C. Corporation

    1. Ownership
    2. Mass production

  D. Profit-making

IV. Raw materials

  A. Wood

    1. Walnut
    2. Pine
    3. Mahogany

  B. Metal

    1. Copper
    2. Aluminum
    3. Brass

C. Plastic

1. Acrylic
2. Polyester resin

D. Leather

1. Cowhide
2. Calfhide
3. Sheepskin
4. Deerhide

References:

Joseph F. Luetkemeyer, Jr., A Historical Perspective of Industry, pp. 59-85.

Title: The Functions of Industry

Presentation:

- I. Research and development functions
  - A. Come up with product idea
- II. Designing and planning functions
  - A. Place idea on paper
- III. Manufacturing functions
  - A. Select stock
    - 1. Choose the material
  - B. Layout
    - 1. Mark on material
  - C. Cut
    - 1. Ex.: saw, knife
  - D. Form
    - 1. Mold
    - 2. Model
  - E. Shape
    - 1. Cut a part of a product
  - F. Assemble
    - 1. Put together
  - G. Finish
    - 1. Ex.: paint, shellac, stain, etc.
  - H. Inspect
    - 1. Look for things that are wrong or incomplete

IV. Distribution functions

  A. Package

    1. Protect product

  B. Ship

    1. Ex.: train, truck, plane, etc.

  C. Sell

    1. Exchange product for money

Reference:

Maine Department of Education, Industrial Arts Technology, p. vi

Title: Market Research and Product Development

Presentation:

I. As a consumer, what qualities do you look for in a TV set?

  A. Price

  B. Quality

  C. Design

  D. Payment method, etc.

II. Show overlays and explain

  A. Marketing inter-relationships

  B. Marketing sub-functions

III. Example of success and failure of market research and advertising

  A. Failure

    1. A pharmaceutical company developed a new pill.
      a. Water was not needed for swallowing it
      b. The item was a failure because consumers were used to using water when taking pills

  B. Success

    1. A softdrink manufacturer noticed that sales were low
      a. Using market research, changes were made in advertising
        1) "Refresh without filling" was the slogan
        2) New approach changed to the "Sociable Drink
          a) Aimed at the young housewife
        3) A later approach was directed at young single people
        4) Advertisements were made in *Life*, *Post* and TV
        5) Results made the softdrink one of the leaders in the softdrink industry

IV. In the case of the Hula Hoop

  A. Suppose a toy company was given the problem

    1. An item made of plastic
    2. Inexpensive to manufacture
    3. Involving physical activity

V. Coming up with a new product idea (refer to paper product)

- A. Ask students how the paper product was developed (Brainstorming)
    1. State problem
    2. Divide into small groups
        - a. Develop ideas
    3. Decide which is the best product
    4. Return to group
    5. Decide which product was the best as a group

VI. Put chainlinks on chalkboard and insert "Market Survey"

- A. Discuss how all of the links are connected

VII. Discuss product board

- A. Take each product and discuss it in terms of:
    1. Material
    2. Student construction

VIII. Make a copper enameling product (as an attention device only)

IX. Hand out sheet with ideas for products and have students select one

References:

Lawrence L. Bethel, Industrial Organization and Management, p. 119.

Bayward O. Wheeler, Business: an Introductory Analysis, pp. 227-229

Title: Industrial Forms of Design

Presentation:

- I. What is design? The process of planning a product
  - A. Tell how design relates to industry and why it is important
  - B. Tell the function of a design engineer
  - C. Ask why it is necessary for a product to have good design
- II. The industrial designing process
  - A. Need
  - B. Research
    - 1. Materials available
    - 2. Cost
    - 3. Tools available
    - 4. Size limits
  - C. Sketches and drawings
    - 1. Forms of design
      - a. Geometric
      - b. Free form
      - c. Sculptured
      - d. Streamlined
      - e. Traditional styles
  - D. Experimentation
    - 1. Scale model
    - 2. Prototype
    - 3. Direct result

References:

Arthur Anderson, A Designers Notebook, pp. 36-37.

John L. Feirer, Drawing and Planning for Industrial Arts, pp. 169-174

Title: How to Prepare an Industrial Production Guide

Presentation:

I. Designing and planning functions

  A. Idea - mind

  B. Rough sketch - looks

  C. Working drawing - size

  D. Bill of materials - cost

  E. Production guide - how to make

II. Fill out production guide heading

  A. Use pencil

  B. Print

III. Make simple rough sketch

  A. Dash method

    1. Straight line
    2. Curved line

  B. Staple sketch in proper position

IV. Explain working drawing

  A. Drawing that you work with

    1. Pattern
    2. Carbon transfer

  B. Demonstration in later lesson

V. Explain bill of materials

  A. Size of materials

  B. Cost of materials

  C. Covered in later lesson

VI. Fill out production guide

  A. Use manufacturing functions as guide

  B. Use sample product

Title: Materials Procurement and Control

Presentation:

I. Analyze product for material need

A. Type of material

1. Wood
2. Metal
3. Leather
4. Plastic

B. Class of material

1. Raw material
2. Purchased parts
3. In-process parts
4. Finished products
5. Supplies
6. Equipment

II. Procurement of materials

A. Industrial sources

1. Supply room
2. Supply cabinet
3. Stock room
4. Warehouse
5. Distribution center

B. Means of Procurement

1. Individual
2. Mail order
3. Truck transportation
4. Rail transportation
5. Plane transportation

III. Complete purchase order

A. General information

1. Department
2. Number
3. Date
4. Checks and approvals

B. Bill of materials

1. Quantity
2. Description
3. Units
4. Unit cost
5. Total cost

IV. Receive materials

   A. Check by materials manager

   B. Receive materials from stock men

References:

Lawrence Bethel, Industrial Organization and Management, pp. 263-283

Title: Industrial Organization and Management

Presentation:

I. Industrial organization forms

A. Individual proprietorships and partnerships

1. Small industries, little capital, easily controlled
2. Manager acquires buildings, capital, machinery and labor

B. Corporation

1. Most industries are organized this way
2. Composed of stock or share-holders who own company
3. Board of Directors to fix policies and manage company

II. Personnel organization

A. Simple line organization

1. Simplest form for small companies
2. Direct line responsibilities
3. Similar to military organization
4. Each member responsible to supervisor, manager or foreman

B. Line and staff

1. For more complex organizations of larger size
2. Consists of supervisors and foremen with supervisory control and assistants and specialists or advisors to help them

C. Line staff and committee

1. Provides further breakdown for larger organizations
2. Committees formed for special work [illegible] may not be permanent

III. Industrial arts laboratory organization

A. Consists of line organization form

B. Provides responsibilities for all personnel

C. Involves and encourages "teamwork" in accomplishment of tasks

D. Functions as a laboratory use and care organization

E. Positions may be elected or appointed

References:

Lawrence L. Bethel, Industrial Organization and Management, pp. 32-52.

Title: How to Layout on Flat Stock

Presentation:

- I. Select wood and layout product
  - A. Demonstrate the tri-square and pencil
    - 1. Draw right angle
    - 2. Check for squareness
  - B. Demonstrate the rule
    - 1. Measure length and mark for squaring
    - 2. Use rule on edge
  - C. Demonstrate use of carbon paper
    - 1. Transfer outline to wood
- II. Select plastic and layout product
  - A. Relate to wood layout
    - 1. Discussion
  - B. Demonstrate the compass
    - 1. Circles and arcs
    - 2. Tangent
- III. Select metal and layout product
  - A. Relate to wood layout
  - B. Demonstrate the scriber
  - C. Demonstrate the combination square
  - D. Demonstrate the dividers
- IV. Select leather and layout product
  - A. Discuss possible layout tools
  - B. Prepare cardboard pattern and trace

References:

John L. Feirer, _Industrial Arts Bench Woodwork_, pp. 34-38.

Roland R. Fraser and Earl L. Bedell, _General Metal_, pp. 17-22.

Title: How to Cut Flat Stock

Presentation:

- I. Backsaw
  - A. Characteristics
    - 1. Fine teeth
    - 2. Stiff back
    - 3. Advantages
    - 4. Disadvantages
  - B. Demonstrate proper use
- II. Coping saw
  - A. Characteristics
    - 1. Flexible blade
      - a. Sharp corners
      - b. Curves
    - 2. Replaceable blade
  - B. Demonstrate proper and safe use on wood and plastic
- III. Hand drill
  - A. Characteristics
    - 1. Demonstrate placement of drill in chuck
    - 2. Drill 5/32" hole in plastic and wood
    - 3. Have students drill one hole also
- IV. Shears
  - A. Aviation snips
    - 1. Demonstrate proper use on copper
  - B. Scissors
    - 1. Demonstrate proper use on leather
- V. Leather punches
  - A. Rotary
    - 1. Demonstrate proper procedure for cutting
    - 2. Demonstrate selection of various size hole selection

B. Lacing punch (thonging punch)

1. Place marking line on leather
2. Demonstrate technique
    a. Place board under leather to prevent cutting bench

References:

Lavon B. Smith and Marion E. Maddox, Elements of American Industry, pp. 83-87, 31-32, 163.

Title: How to Shape Flat Stock

Presentation:

I. Sheet abrasives

A. Describe abrasives

1. Define: a tool with thousands of tiny cutting edges
2. Describe structure (transparency)
3. Demonstrate size and cut of grit
    a. Fine - small scratches
    b. Medium - larger scratches
    c. Coarse - largest scratches
4. Describe order of use
    a. Start with coarse
    b. Work to fine
5. Describe proper abrasive for each material
    a. Wood
        1) Garnet
        2) Aluminum
    b. Metal and plastic
        1) Silicon carbide
        2) Crocus

B. Demonstrate use

1. Hold stock
    a. Hand
    b. Vise
2. Prepare abrasive sheet
    a. Pad
    b. Strip
3. Cut stock
    a. Wood - with grain
    b. Metal and plastic - in one direction

II. Files

A. Describe file

1. Describe structure
    a. One solid piece of metal
    b. Individual cutting edges
    c. A different number of teeth
2. Describe order of use
    a. Start with coarse
    b. Work to fine
3. Select correct file
    a. Pick shape to fit surface being cut
    b. Ex.: Half-round for concave, flat for convex

B. Demonstrate use

  1. Hold stock
     a. Hand
     b. Vise
  2. Hold file correctly
     a. Handle in right hand
     b. Tip of file with thumb and first finger of left hand
  3. Cut
     a. Cut on forward stroke
     b. Lift up on back stroke

References:

Oswald A. Ludwig, Metalwork Technology and Practice, pp. 96, 334.

Title: How to Form Flat Stock

Presentation:

- I. Metal forming
  - A. Hand forming
    - 1. Pliers
    - 2. Vise
    - 3. Bending jig
    - 4. Hammer and sand bag (raising)
    - 5. Hammer and form (beating down)
  - B. Machine forming
    - 1. Brake
    - 2. Slip roll
- II. Plastics forming
  - A. Casting
    - 1. Types of forms and molds
    - 2. Mixing of catalyst and resin
    - 3. Coloring
    - 4. Pouring
    - 5. Hardening
    - 6. Embedding
  - B. Bending
    - 1. Acrylic thermoplastic
      - a. Colors
      - b. Types
    - 2. Heating of acrylic
    - 3. Methods of forming
      - a. Molds (compression molding)
      - b. Forming by hand

References:

American Handicrafts Company, Catalog, pp. 1-4

Roland R. Fraser, General Metals, pp. 49-60

C. Vernon Siegner, Art Metalwork, pp. 40-42

Title: How to Use Assembly Tools and Materials

Presentation:

- I. Prepare stock
  - A. Wood
    - 1. Smooth
    - 2. Free of dust and dirt
  - B. Plastic
    - 1. Remove protective paper
    - 2. Clean with alcohol
- II. Select proper adhesives
  - A. White resin glue
  - B. Ethylene di-chloride
  - C. Rubber cement
- III. Apply adhesives
  - A. Wood
    - 1. Apply white glue to both contact surfaces
    - 2. Be sure surfaces are completely coated
  - B. Plastic
    - 1. Apply ethylene di-chloride to both contact surfaces
    - 2. Use eye dropper for easy application
  - C. Leather
    - 1. Apply rubber cement to both contact surfaces
    - 2. Set until dry
- IV. Clamp stock
  - A. Wood
    - 1. Hand screw clamp
    - 2. Even pressure
  - B. Plastic
    - 1. Hand
    - 2. Even pressure

C. Leather

   1. Press surfaces together

References:

Raymond Cherry, _General Plastics_, pp. 34-36

John L. Feirer, _Industrial Arts Bench Woodwork_, pp. 125-130

Title: Finishing Methods and Tools Used in the Manufacture of Personal Accessories

Presentation:

I. Preparation of articles for finishing

A. Why does a product need a finish?

1. Beauty, color
2. Protection
3. Wearing qualities
4. Texture

B. Getting ready to apply a finish

1. Smoothing with abrasive
    a. Wood - garnet abrasive paper
    b. Metal - emery, silicon carbide or steel wood
    c. Leather - edge creaser
    d. Plastic - silicon carbide, buffing compound
2. Cleaning
    a. Steel wool
    b. Alcohol
    c. Oxalic acid

II. Finishing a product

A. Buffing

B. Copper enameling

C. Oil finish

D. Lacquer spray or brushing

E. Planishing

References:

Lavon B. Smith, Marion E. Maddox, Elements of American Industry, pp. 56-64, 105-112, 162

Title: How to Copper Enamel

Presentation:

I. The term "enameling" means the process of applying a thin coat of glass onto a metal

  A. When heated to a high temperature, the glass melts and fuses to the metal

II. The first operation is to clean the metal

  A. Use emery paper or cloth

  B. Steel wool

III. Agar is a liquid which is swabbed or brushed on next

  A. It is an adhesive solution

IV. The colored glass is then dusted on the metal

V. Glass chunks and threads are then added to the metal

VI. Place in the kiln and heat until glass flows

VII. Remove from kiln and allow to cool

VIII. If deeper colors are desired:

  A. Repeat step IV

  B. Reheat the metal

References:

American Handicrafts Company, Instructor's Manual, p. 40

Title: Packaging Products in the Personal Accessories Industry

Presentation:

I. Packaging in industry

  A. History of packaging

   1. Wood, cloth and skins were used in early times to transport
   2. Glass bottles revolutionized packaging in 1700's
   3. Package industry amount to 12 billion dollars annually at present

  B. Need for packaging

   1. Protection of goods
   2. Advertisement of the product
   3. Give product eye appeal

  C. Kinds of packages

   1. Boxes
   2. Plastic
   3. Cards
   4. Can, bottles
   5. Bags, sacks

II. Packaging a product in the Industrial Arts laboratory

  A. Design a package

  B. Make it

  C. Package the product

References:

Donald E. Cooke, Marvels of American Industry, pp. 265-266

Title: Pricing and Marketing Techniques Used in the Personal Accessories Industry

Presentation:

- I. Single ownership
  - A. Manufactures products
  - B. Advertise
    - 1. Newspaper
    - 2. Local radio station
  - C. Sell merchandise
    - 1. Determining price to charge

a. Basic material	$ .12
b. Direct cost	.39
1. Labor	
c. Indirect expense	.17
1. Heat	
2. Lights	
3. Rent	
	$ .68
d. Profit (50% of cost)	.34
	$1.02

  - D. Sell to store in town
  - E. Sell to small chain of stores
- II. Corporation
  - A. Market research
    - 1. Customer demand
  - B. Research engineering
    - 1. Product improvement
  - C. Production
    - 1. Number of units to be produced
  - D. Sales
    - 1. Number of units to be sold

- E. Dealer
  - 1. Determine customer needs
- F. Customer
  - 1. Eventual consumer

III. Conclusion

- A. Whether business is large or small, basic marketing procedures of pricing and marketing do not change

References:

Lawrence L. Bethel, Industrial Organization and Management, p. 119.

Robert W. Haus, Manufacturing in the School Shop, pp. 42-44.

GROUP DISCUSSION ON CONCEPTS OF INDUSTRIAL ARTS

Directions: As a group, think about each question carefully and then write down the answer that the group decides on.

1. What do industries do for us?

2. If you had a job in industry, what would be expected of you as a worker?

3. What are some of the functions of an industry?

4. What do you think is the purpose of Industrial Arts?

UNIT EVALUATION NAME ____________________

PERSONAL ACCESSORIES

Part I. Directions: Place the letter of the best possible answer in the blank provided at the left.

___ 1. A tool used to produce fine scratches on the surface of material is called
a. a saw
b. a file
c. an abrasive
d. a scraper

___ 2. A file is designed to cut on the ___ stroke.
a. forward
b. back
c. either

___ 3. Which of these objects have free form design?

a. b. c.

___ 4. When a product is designed, a person must be sure that
a. the materials are available
b. the cost is reasonable
c. it is of a reasonable size
d. all of these

___ 5. Emery abrasive paper is used mainly on what material?
a. wood
b. plastic
c. leather
d. metal

___ 6. The packaging industry is best described by
a. putting wrappers on products
b. a small industry designed to make more jobs for people
c. a multimillion dollar industry involved in packaging products that will appeal to the customer and sell

___ 7. A steel rule would be used for
a. measuring
b. laying out
c. shaping
d. marking

___ 8. Which of these is the best material for joining two pieces of acrylic plastic together?
a. DUCO cement
b. rubber cement
c. white resin glue
d. ethylene dichloride

___ 9. When gluing two pieces of wood together, glue should be applied
a. to one surface
b. to both surfaces
c. very heavily
d. only around the outside edges

___ 10. Industries have their workers assigned to certain jobs for more successful production. This is called:
a. product planning
b. engineering
c. personnel organization
d. worker organization

___ 11. In industry, a person who guides, directs and assists workers under him is called a:
a. foreman
b. supervisor
c. manager
d. chairman
e. all of these
f. none of these

___ 12. The industrial arts laboratory organization of workers:
a. makes everyone responsible for a job.
b. allows some people freedom to do as they please.
c. helps to make better products.
d. gives everyone a chance to be "boss."

___ 13. The process of enameling on copper refers to which process?
a. cutting
b. forming
c. shaping
d. finishing

___ 14. The material to be placed on the copper to be melted is:
a. paint
b. glass
c. plating solution
d. solder

___ 15. The liquid placed on the clean copper to prepare for enameling is:
a. a dye
b. a colored material
c. an adhesive solution
d. copper sulphate

___ 16. "Brainstorming" is a process where:
a. one person works on a problem
b. an answer to a problem is decided by top management
c. a group of persons work out a solution to a problem
d. a problem exists but no answer is available

___ 17. A market survey is used to:
a. decide how a product should be produced
b. save money in production of the item
c. determine customers' desires
d. sell stock in the corporation

___ 18. In industry, direct expenses would include:
a. labor
b. overhead
c. dividends
d. bad debts

___ 19. In industry, indirect expenses would include:
a. labor
b. overhead
c. basic materials
d. raw materials

___ 20. The unusual part of a backsaw is:
a. the length
b. fine teeth
c. rigid back
d. the handle

___ 21. The coping saw is used to cut:
a. wood and plastic
b. metal
c. leather
d. cast iron

Part II. Directions: Complete the following sentences with as many words as you need.

1. Name two tools used for drawing circles and arcs.

______________________ ______________________

2. Name two tools used for laying out square corners.

______________________ ______________________

3. Name two hobbies in which you might make products, classified as personal accessories.

______________________ ______________________

4. List four materials used in the personal accessories industry and a product made from each.

______________________ ______________________

______________________ ______________________

5. Give two reasons why society has a need for the personal accessories industry.

____

____

6. Give two reasons why a product needs a finish.

______________ ______________

7. Give two reasons why a product is put in a package.

______________ ______________

8. Complete a sample purchase requisition as explained below.

Product: a plastic key tag. Material: three pieces of plastic made from red, yellow and green, each two inches square. Cost: 1¢ per square inch.

QUANTITY	SIZE, COLOR, MATERIAL	UNITS	TOTAL COST

Part III. Directions: Match the statement at the left with the word or words at the right and write the letter on the line.

A. ___ 1. A raw material
___ 2. A finish
___ 3. A purchased part
___ 4. A piece of equipment
___ 5. A hand tool

a. water
b. files
c. linseed oil
d. bead chain
e. leather
f. buffer

B. ___ 1. Material selection
___ 2. Layout
___ 3. Cut
___ 4. Form
___ 5. Shape
___ 6. Assemble
___ 7. Finish
___ 8. Inspect

a. sawing materials
b. checking for things wrong
c. painting the product
d. marking on material
e. taking material from stock
f. gluing material together
g. filing rough edges of material
h. bending hot plastic

C. ___ 1. Idea
___ 2. Rough sketch
___ 3. Working drawing
___ 4. Purchase requisition
___ 5. Industrial production guide

a. cost of materials
b. what the product will look like
c. how to make the product
d. a picture formed in the mind
e. size of the product

How would you form the following personal accessories? Choose the best method.

C. ___ 1. copper tray
___ 2. plastic bowl
___ 3. metal bracelet
___ 4. copper tie pin
___ 5. embedded coin·key tag
___ 6. snake ring

a. casting
b. box and pan brake
c. hammer and sand bag
d. slip roll
e. heating in an oven
f. sheetmetal stake
g. by hand

UNIT EVALUATION

PERSONAL ACCESSORIES

ANSWER SHEET

Part I.

1. C
2. A
3. B
4. D
5. D
6. C
7. B
8. D
9. B
10. C
11. E
12. A
13. D
14. B
15. C
16. C
17. C
18. A
19. B
20. C
21. A

Part II.

1. Company, divider
2. combination square, tri-square
3. leather, copper enameling
4. leather, key case
   wood, earrings
   metal, pin
   plastic, zipper pull
5. provide products to purchase;
   provide jobs for people
6. for protection;
   adds to appearance
7. to protect;
   to beautify
8. quantity 1 (each)

size	color	material
2 x 2	red	plastic
2 x 2	yellow	"
2 x 2	green	"

Units: 4 square inches (each)
Total cost: 4¢ (each)

Part III.

A. 1. A
2. C
3. D
4. F
5. B

B. 1. E
2. D
3. A
4. H
5. G
6. F
7. C
8. B

C. 1. D
2. B
3. E
4. A
5. C

D. 1. C
2. E
3. D
4. B
5. A
6. F

TITLE OF UNIT

INTRODUCTION TO INDUSTRIAL ARTS AND TECHNOLOGY

TEACHING TEAM

JOHN SWANSON
AUBREY KNOWLEN
RICHARD DEAN
WILLIAM FINDLEN
KENNETH OLSON

NDEA INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

We are living in an age when industry and technology are having an ever-increasing effect on the lives of each individual. Society has accepted and even demanded many of the technological changes and advances because of the benefits of improved living conditions. Concurrently, however, there has developed a greater need for understanding of the technology in order to better prepare for, adjust to, and cope with the many problems resulting from these changes.

Industrial arts can make a unique contribution to early school leavers and to the college-bound youngster; to those of both low and high scholastic ability; for the future industrial worker and for future professionals; and for those at all levels of the economic spectrum. All members of society must learn to be aware of and to live effectively in today's technological culture.

This unit is designed to interest and orient the junior high pupil to the industrial arts program as it relates to the general school program and society. It is a guide to introduce the pupil to technology and the order and structure necessary in modern industry.

SCOPE:

This unit is intended for junior high students (7th, 8th, 9th) who have had no previous experience with industrial arts and technology. The time alloted need not be more than 160 minutes. The class should not exceed twenty students that are heterogeneously grouped.

This unit will cover administrative details that pertain to the industrial arts laboratory and will attempt to associate industrial arts with industry and technology.

OBJECTIVE 1: To develop an understanding of the meaning and purpose of industrial arts and its relationship to industry and technology

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Relate how industrial arts fits into their education.	1. View film: "The Factory"	Orientation to Industry, Society and Technology
	2. Discuss the film.	

OBJECTIVE 2: To develop a desirable attitude toward the organization and operation of the industrial arts program

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Enter, participate and depart in an orderly fashion.	1. Discuss and negotiate a contract.	Administration of an Industrial Arts Laboratory
2. Recognize the need for administrative detail in industrial situations	2. Review and discuss the floor plan.	
	3. Tour the lab.	
	4. Make name tags.	

APPROACH:

This unit is introduced by:

A. Viewing and discussing a film to orient the student to industry and mass production.

B. Touring the laboratory facilities.

C. Using a contract for organization and behavior in the laboratory.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T., *Manufacturing Organization and Management*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1966. Chap. 3.

Bittel, Lester R., *What Every Supervisor Should Know*, New York: McGraw-Hill Publishing Co., 1959. Chap. 13.

Olson, Delmar W., *Industrial Arts for the General Shop*, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965. Chap. 1.

Olson, Delmar W., *Industrial Arts and Technology*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963. Chap. 3 and 4.

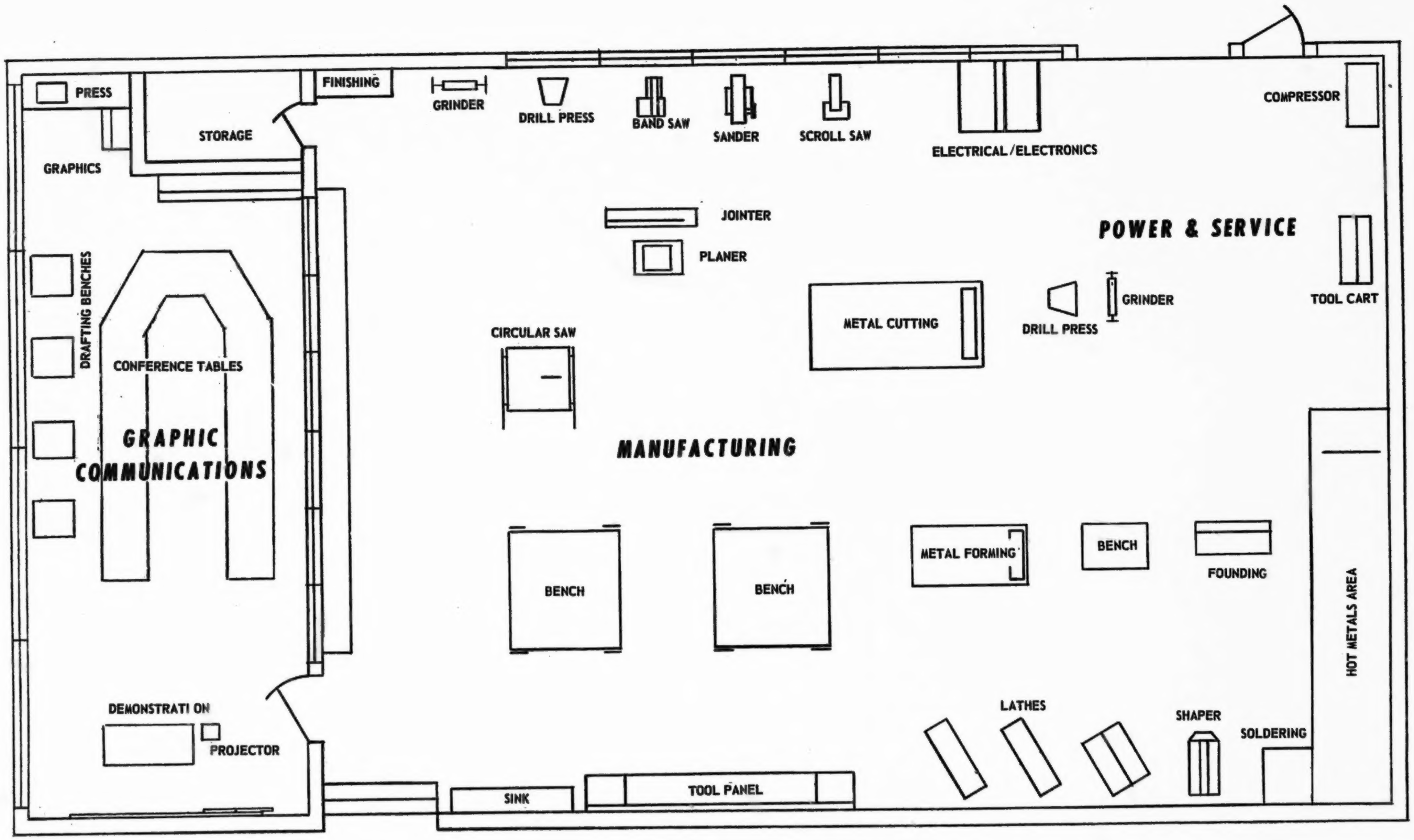
RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Floor plans with overhead transparency of same

2. Film: The Factory. How a Product is Made., #11684 - University of Michigan Audio Visual Education Center, 720 E. Huron Street, Ann Arbor, Michigan. Cost: $6.50

3. Contract covering administrative details for procedure and behavior in the laboratory. (Overhead transparency of contract as well as two copies of the contract for each student - student copy and management copy.)


PRESS
STORAGE
FINISHING
GRINDER
DRILL PRESS
BAND SAW
SANDER
SCROLL SAW
ELECTRICAL/ELECTRONICS
COMPRESSOR
GRAPHICS
JOINTER
PLANER
POWER & SERVICE
TOOL CART
DRAFTING BENCHES
CONFERENCE TABLES
GRAPHIC COMMUNICATIONS
CIRCULAR SAW
METAL CUTTING
DRILL PRESS
GRINDER
MANUFACTURING
BENCH
BENCH
METAL FORMING
BENCH
FOUNDING
HOT METALS AREA
DEMONSTRATI ON
PROJECTOR
LATHES
SHAPER
SOLDERING
SINK
TOOL PANEL

LABORATORY OF INDUSTRIES

GORHAM STATE COLLEGE

THE CONTRACT:

A dictionary defines a contract as a written agreement between two or more parties. It is the written evidence of such an agreement. (In our industrial society, there is much need for contracts between manufacturers and buyers, between companies and their employees, between stores and consumers, etc.) With the use of these contracts, it is much easier for all parties to remember the terms of agreements that they have made in the past.

Just as any large corporation or business needs rules and regulations to carry on their work in an efficient way, industrial arts laboratories need them also so that we may get the job done with the least amount of confusion. We will use a contract between you, the student, and the instructors, the management, in this industrial arts laboratory. This contract will be an agreement between two parties as to the rules and regulations necessary for the orderly procedures in this class.

CONTRACT

I, ______________________________ being a duly qualified student at Gorham State College Laboratory of Industries, do agree to the following rules and regulations as being necessary to orderly procedure to be followed during the time period that I am working in the Laboratory of Industries:

Rules:

1. All students will report for work at 11:00 a.m., E.D.T., from July 15, 1968 to August 2, 1968 in the classroom of the Laboratory of Industries, Room 200A - Gorham State College, Industrial Education and Technology Center. They will be seated quietly waiting for the day's assignment.
2. All students will have the following equipment with them at all times:
    a. pencil
    b. notebook
    c. apron (will be provided)
3. All students will follow all safety rules and use all safety devices outlined and prescribed during the course.
4. All students will do the assigned work to the best of their ability.

I, ______________________________, have read this contract, understand the terms of this contract, and will follow, to the best of my ability, the items contained in it.

Date ______________ Signed ____________________________

****

Acceptance for staff of the Laboratory of Industries by

Signed ______________________________ Date ____________

TOOLS AND EQUIPMENT:

Those found in the typical industrial arts laboratory, including:

1. Sixteen mm. sound projector with screen
2. Felt tip pens
3. Overhead projector

MATERIALS AND SUPPLIES:

1. Name tag material
2. Folders

LESSONS TO BE TAUGHT:

Orientation to Industry, Society and Technology

Administration of an Industrial Arts Laboratory

Title: Orientation to Industry, Society, and Technology

Presentation:

I. Introduction to course and relate to film

  A. The corporation setup

  B. The manufacture by mass production of a product

II. Introduce the film

  A. Many people working together

  B. The planning, preparation, and work involved in mass production

III. Outline the procedure followed by the planning board for a new idea

  A. Idea is formulated

  B. Rough sketches are made

  C. Experimental department makes a model

  D. Planning board approves

IV. Engineering and tooling department

  A. Decide on tools and materials needed

  B. Tools and blueprints are made

V. Purchasing department

  A. Order materials

VI. Personnel department

  A. Interviewing hired help

VII. Receiving department

  A. Receive materials

VIII. Production line and manufacture of product

  A. Setup of line

  B. Automatic machines

Title: Orientation to Industry, Society and Technology (continued)

- C. Mass production of parts
- D. Assembly line procedures
- E. Tests of working parts

IX. Order followed after manufacture of product

- A. Packaging
- B. Sales
- C. Shipping
- D. Retail
- E. Consumer

References:

Film: *The Factory*. *How a Product is Made*.

Title: Administration of the Industrial Arts Laboratory

Presentation:

I. The floor plan

A. Architectural drawing

B. Machines in logical order

C. Block plan

D. Planning product flow

II. The contract

A. An agreement

B. When used

C. A set of rules to be followed

D. Legal aspects

E. Negotiation of a contract

References:

Bittel, Lester R., What Every Supervisor Should Know, Chap. 13

UNIT EVALUATION:

Evaluation of this unit will be by observation of the students' ability to function properly in the industrial arts laboratory setting and whether or not he seems to have an idea of the relationship of industrial arts to school and society.

TITLE OF UNIT

INTRODUCTION TO MANUFACTURING THROUGH THE STUDY OF THE CAMPING EQUIPMENT INDUSTRIES

TEACHING TEAM

JOHN SWANSON
AUBREY KNOWLEN
RICHARD DEAN
WILLIAM FINDLEN
KENNETH OLSON

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY FOR INDUSTRIES"

Department of Industrial Education and Technology

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July 1 - August 9, 1968

INTRODUCTION:

Our great American society is built on our ability to develop and improve our industrial, technical facilities. Nations and cultures who fail to do this soon fall by the wayside.

Many changes in the composition of our world society have occurred in recent years. There has been rapid economic expansion, stable employment, rapid rise in population, industrialization of backward nations, and a general world-wide demand for a higher standard of living. One need only to pick up a daily newspaper to have these facts brought home.

The study of, and involvement in, our industrial society is not only an extremely exciting and rewarding experience for the youth of today, it is also a necessity for him if he is to take his place in this world society so that he may become a valuable asset to the continued improvement of our national heritage. Through the varied activities of this unit, he should find a place where he can develop, expand, and test his individual talents.

JUSTIFICATION FOR STUDYING CAMPING EQUIPMENT INDUSTRIES:

With the advancement of technology in our culture, the average American suddenly finds himself with more and more leisure time on his hands. He also has more money to spend on consumer goods, thus raising his standard of living.

In the search for a profitable use of this leisure time, many Americans have turned to camping in the great outdoors of the world. As a result, the camping equipment industries have had a great increase in the demand for its products.

Pupils should have a great deal of interest in camping equipment because of their natural interest in the lure of the great outdoors. Because of this interest, they should be highly motivated to study the total manufacturing activities that are associated with the development of camping equipment.

SCOPE:

This unit is designed for seventh or eighth grade pupils having no previous industrial arts laboratory experience. It is intended to accommodate up to twenty pupils and to cover an approximate time schedule of 960 minutes, or twenty four 40 minute periods.

The pupils involved are of average abilities and heterogeneously grouped.

In this unit, the pupils will be introduced to the organization and structure of a corporation involved in the mass production of goods. It is expected that they will gain only the basic tool skills necessary to develop and produce a simple product by mass production. The major emphasis of this unit shall be on a basic understanding of the functions of the various elements of the corporate mass production industries. The activities carried on will be mainly motivational, so that the pupil will enter into progressive units eager to acquire and develop, to a greater degree, the knowledge and skills gained in this unit.

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize the structure of a manufacturing organization	1. Study line and staff organization	Line and Staff Organization in a Corporate Manufacturing Industry
2. Explain the function of the marketing division of a manufacturing industry (sales, advertising, service, market research, distribution)	2. a. Study worksheet on marketing b. Do a problem in one of the areas of marketing 1) Develop advertising poster 2) Develop package for the product 3) Develop a TV commercial to sell the product 4) Develop singing commercial	Functions and Activities of the Marketing Division of a Corporate Manufacturing Industry
3. Explain the functions of the finance division of a manufacturing industry (stocks, bonds, budgeting, paying and receiving)	3. a. Study a worksheet of financing an industry b. Fill out a time sheet and compute a payroll	Functions and Activities of the Finance Division of a Corporate Manufacturing Industry

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	3. c. Examine financial page of a newspaper	
	d. Do a problem with stocks	
4. Explain the function of the engineering division of a manufacturing industry (product design, quality control, tooling methods, plant maintenance, safety, work schedule)	4. a. Examine working drawings	Functions and Activities of the Engineering Division of a Corporate Manufacturing Industry
	b. Develop a product flow chart	
	c. Inspect and criticize their own work for quality	
	d. Suggest improvement of tool, jig, and fixture design	
	e. Develop simple jigs and fixtures	
	f. Develop a plant maintenance and safety procedure	

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	4. g. Suggest and develop new products for manufacturing	
	h. Make sketches for new products, jigs and fixtures	Basic Elements of Engineering Drawing
	i. View film "According to Plan," McGraw-Hill	
	j. Examine drawing instruments and equipment	
5. Explain the function of the personnel division of a manufacturing industry (employment, employee relations, training)	5. a. Examine want ads	Functions and Activities of the Personnel Division of a Corporate Manufacturing Industry
	b. Apply for job (fill out a job application)	
	c. Job interviews with self-criticism	
	d. Receive training for a specific job	
	e. Develop and organize a union	Development, Organization and Function of Unions

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
6. Explain the function of the production division of a manufacturing industry (purchasing, production planning, manufacturing)	6. a. Develop production flow chart for a product b. Develop bill of material for a product c. Make a product d. Package a product e. Develop a product schedule	Functions and Activities of the Production Division of a Corporate Manufacturing Industry

OBJECTIVE 2: Discover and develop a degree of skill in the elements of the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize the main manufacturing processes from layout to finish	1. View specific jobs in the manufacture of a product	Overview of the Manufacturing Processes
2. Recognize and use layout tools and procedures	2. a. Locate and name the layout tools he will use	Common Layout Processes a. Hand Layout b. Patterns c. Templates d. Measurement e. Terminology
	b. Demonstrate safe use of layout tools he will use	
	c. Use simple layout tools in the manufacture of a product	
3. Recognize and use cutting tools and procedures	3. a. Locate and name the cutting tools and machines he will use in the manufacture of a product	Common Cutting Processes a. Hand Cutting b. Sawing c. Abrasives d. Filing e. Shearing f. Drilling
	b. Demonstrate safe use of each machine and tool used for cutting	
	c. Use proper cutting tool in the manufacture of a product	

OBJECTIVE 2: Discover and develop a degree of skill in the elements of the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
4. Recognize and use forming and shaping tools and procedures	4. a. Locate and name the forming and shaping tools he will use	Common Forming and Shaping Processes a. Bending b. Stamping
	b. Demonstrate safe use of each machine and tool used for forming and shaping	
	c. Use forming and shaping tools in the manufacture of a product	
5. Recognize and use holding tool and procedures	5. a. Locate and name the holding tools and machines he will use in the manufacture of a product	Common Holding Processes a. Jigs and Fixtures b. Clamping and Holding Devices
	b. Demonstrate safe use of each tool used for holding	
	c. Use holding tools in the manufacture of a product	

OBJECTIVE 2: Discover and develop a degree of skill in the elements of the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
6. Recognize and use assembly tools and procedures	6. a. Locate and name the assembly tools he will use in the manufacture of a product	Common Assembly Techniques a. Riveting, Pop b. Riveting, Peened c. Force Fit
	b. Demonstrate safe use of each machine and tool used for assembly	
	c. Use assembly tools in the manufacture of a product	
7. Recognize and use finishing tools and procedures	7. a. Locate and name the finishing tools and procedures he will use in the manufacture of a product	Common Finishing Techniques a. Polishing b. Sanding c. Dip Finish
	b. Demonstrate safe use of each tool used for finishing	
	c. Use finishing tools in the manufacture of a product	
	d. Use finishes on the product he is to manufacture	

OBJECTIVE 2: Discover and develop a degree of skill in the elements of the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
8. Care for tools, equipment and facilities	8. a. Return tools to panels as soon as possible after use b. Demonstrate simple maintenance procedures on tools, machines, and equipment; eg. oil, wipe, polish, clean, etc. c. Participate in clean-up operations in the laboratory	Maintenance Procedures a. Principles b. Organization

OBJECTIVE 3: To develop desirable attitudes about his place in an industrial, technical society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Demonstrate safe work habits through his actions	1. a. See and discuss safety film b. Prepare a safety bulletin for fellow students c. Discuss fire hazards, extinguishers, and color coding d. Report all broken or damaged tools e. Use safety glasses or shields	Safety in Industry and in the Laboratory (Included in each lesson where applicable)
2. Work cooperatively and show respect toward management and fellow workers	2. a. Discuss personal and group responsibilities in the laboratory b. Participate in a group project on advertising c. Assist each other when needed	Employee and Employer Relationships in Industry (Included in lessons on personnel and unions; also in each lesson where applicable)

OBJECTIVE 3: To develop desirable attitudes about his place in an industrial, technical society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
3. Recognize technical, aesthetic and functional qualities of design	3. a. Compare and evaluate typical related projects	Elements of Design (Included in engineering lesson, also where applicable)
4. Recognize and appreciate quality workmanship and standards in the products of industry	4. a. Discuss and compare two brand name products	Standards and Quality Control in Industry and the Laboratory (Included under production lesson, also where applicable)
	b. Discuss the quality of workmanship of products they have made	
	c. Discuss quality control	
5. Recognize varied occupational opportunities offered by industry	5. Make a cross-sectional list of the employment offers	Industrial Occupations and You (Included where applicable)
6. Recognize the need to use materials and time as economically as possible	6. a. Discuss how industry utilizes scrap materials	Economy of Materials and Labor (Included where applicable)
	b. Determine own efficiency by comparing estimated time with actual time	

OBJECTIVE 3: To develop desirable attitudes about his place in an industrial, technical society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	6. c. Participate in a time motion study	
	d. Keep a daily time ticket	
	e. Practice economical layout	
7. Recognize the need for care and maintenance of tools and equipment	7. a. Return tools to proper panels after use	Care and Maintenance of Tools and Equipment (Include in each lesson where applicable)
	b. Participate in a personnel organization	
	c. Check tools and equipment as a foreman	
	d. Do simple maintenance and report those of a more complex nature	

APPROACH:

Using camping equipment industries as the motivational media and wood and metal as construction materials, the pupil will be introduced to the corporate mass production industries. It should be recognized, however, that any industry using a similar organizational pattern could be substituted as a motivational factor. The specific materials and tools used are also subject to individual interests and product selection.

The pupil will be given an overview of the basic organization and functions of the mass production industries by using lectures, discussions, audio-visual aids, motion pictures, demonstrations, dramatized experiences, contrived experiences, and direct, purposeful experiences. The specific approaches taken are:

A. Finance
    1. Buying stock in the organization
B. Personnel
    1. Introduction of personnel organization
    2. Using the job application form
    3. Interviewing pupils for the jobs
C. Engineering
    1. Inspecting and developing a simple engineering drawing
D. Manufacturing
    1. Mass producing a product
E. Marketing
    1. Analyzing the cost of producing a product
    2. Packaging the product for sale

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T.; Ritchey, John A.; and Hulley, Oliver S.; *Manufacturing Organization and Management*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc, 1966.

Anderson, Arthur D., *A Designer's Notebook*, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1966.

Bethel, Lawrence L., *Industrial Organization and Management*, New York: McGraw-Hill Book Company, 1962.

Bittel, Lester R., *What Every Supervisor Should Know*, New York: McGraw-Hill Book Company, 1959.

Common Body of Knowledge for Management Consultants, New York: Association of Consulting Management Engineers, Inc., 1957.

Cunningham, Beryl M. and Holtrop, William F., *Woodshop Tool Maintenance*, Peoria, Illinois: Charles A. Bennet Company, Inc., 1956.

Dale, Edgar, *Audio-Visiual Methods in Teaching*, New York: Henry Holt and Company, 1954.

Ericson, Emanuel E., *Teaching the Industrial Arts*, Peoria, Illinois: Charles A. Bennett Company, Inc. 1946.

Fraser, Roland R., *General Metal Principles, Procedures, and Projects*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1955.

Groneman, Chris H., *General Shop*, New York: McGraw-Hill Book Company, Inc., 1963.

Haws, Robert W. and Schaefer, Carl J., *Manufacturing in the School Shop*, Chicago, Illinois: American Technical Society, 1960.

Lindbeck, John, *Design Textbook*, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1964.

L. L. Bean, Inc., *Spring Catalog*, Freeport, Maine, 1968.

Maley, Donald, *Various Methods of Teaching Industrial Arts*, Prince George's County, Maryland: Industrial Arts Curriculum Workshop, 1961

Mager, Robert F., *Preparing Instructional Objectives*, Palo Alto, California: Fearon Publishing Company, 1962.

Newell, Adnah C. *Coloring, Finishing and Painting Wood*, Peoria, Illinois: Charles A. Bennett Company, 1940.

Olson, Delmar W., *Industrial Arts and Technology*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963.

_______________, *Industrial Arts for the General Shop*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1955.

Silvius, Harold G., *Organizing Course Materials*, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1961.

_______________, *Teaching Multiple Activities in Industrial Education*, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1956.

State of Georgia, *Industrial Arts for the Middle Grades*, Atlanta, Georgia Department of Education, 1967.

State of Maine, *Industrial Arts Technology, A Study of American Industry*, Augusta, Maine, Bureau of Vocational Education, 1965.

State of Maine, *Interpreting Industry Through Line Production*, Augusta, Maine: Bureau of Vocational Education, 1962.

State of Maine, *Labor Laws of Maine*, Augusta, Maine: Commissioner of Labor and Industry, 1965.

The Vital Link, AFL-CIO, 1964

Your New Social Security Law Report, Including Medicare, Clifton, New Jersey: Marshall Publications, 1967.

Your Union, Building Service Employees International Union, undated

RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Solid form

   a. Industry mobile
   b. "Gas Pump" blackboard tool
   c. Picket signs
   d. Blocks to illustrate units of measure
   e. Jigs and fixtures to mass produce a product
   f. Bag of 100 pennies
   g. Test grading device
   h. Sample of product to be produced (spatula)

2. Charts, forms, information sheets, etc.

   a. Drawings for spatula - 4
   b. Drawings for jigs and fixtures - 5
   c. Job application
   d. Want ads
   e. Pay check and voucher
   f. Stocks
   g. Union organization chart
   h. Process flow chart
   i. Engineering drawing explanation chart
   j. Cost analysis chart
   k. Income tax forms, W-2, W-4, 1040
   l. Bill of material chart
   m. Sample packages
   n. Song sheet for singing commercial
   o. Weekly time sheet
   p. Line and staff organization charts
      1) Typical
      2) "Campcrafters, Inc."
   q. Applicant appraisal form
   r. Record of employment form
   s. Newspaper clippings
      1) Want ads
      2) Stock prices
      3) Sale of stock
   t. Language of unionism information sheet
   u. Job analysis sheet
   v. Floor plan of laboratory
   w. Sales and markets sheet

3. Other

   a. Various catalogs, magazines, etc. for product ideas
   b. Flat pictures for product ideas and motivation

4. Equipment

   a. Closed circuit television
   b. Video tape recorder
   c. 16 mm. sound projector
   d. Overhead projector
   e. Opaque projector
   f. Polaroid camera
   g. Ozalid printer

5. Films

   a. "The Factory, How a Product is Made," #11684, University of Michigan, Audio Visual Education Center, 720 E. Huron Street, Ann Arbor, Michigan
   b. "According to Plan," McGraw-Hill Book Company, Engineering Drawing Series

TOOLS AND EQUIPMENT:

Common tools and equipment found in a normal laboratory

Special tools used: lathe duplicator

LESSONS TO BE TAUGHT:

Overview of the Manufacturing Process

Line and Staff Organization in a Corporate Manufacturing Industry

Functions and Activities of the Finance Division of a Corporate Manufacturing Industry

Functions and Activities of the Personnel Division of a Corporate Manufacturing Industry

Functions and Activities of the Engineering Division of a Corporate Manufacturing Industry

Basic Elements of Engineering Drawing

Functions and Activities of the Production Division of a Corporate Manufacturing Industry

Development, Organization and Function of Unions

Safety in Industry and the Laboratory

Maintenance Procedures

Common Cutting Processes

Common Forming and Shaping Processes

Common Layout Processes

Common Holding Processes

Common Finishing Techniques

Common Assembly Techniques

Functions and Activities of the Marketing Division of a Corporate Manufacturing Industry

Title: Overview of the Manufacturing Process

Presentation:

I. Corporation set-up

A. Line and staff

B. What is a corporation

II. Procedures for manufacturing a product

A. Planning board

1. Idea
2. Rough sketches
3. Model
4. Approval

B. Engineering and tooling

1. Tools and materials needed
2. Make tools and blueprints

C. Purchasing department - orders materials

D. Personnel department

1. Hire help
2. Train help
   a. To operate necessary machines
   b. Leadership positions

E. Receiving department - receives materials

F. Production line and manufacture of product

1. Set-up of line
2. Mass production of parts
3. Assembly
4. Check quality

G. Package, sell, ship

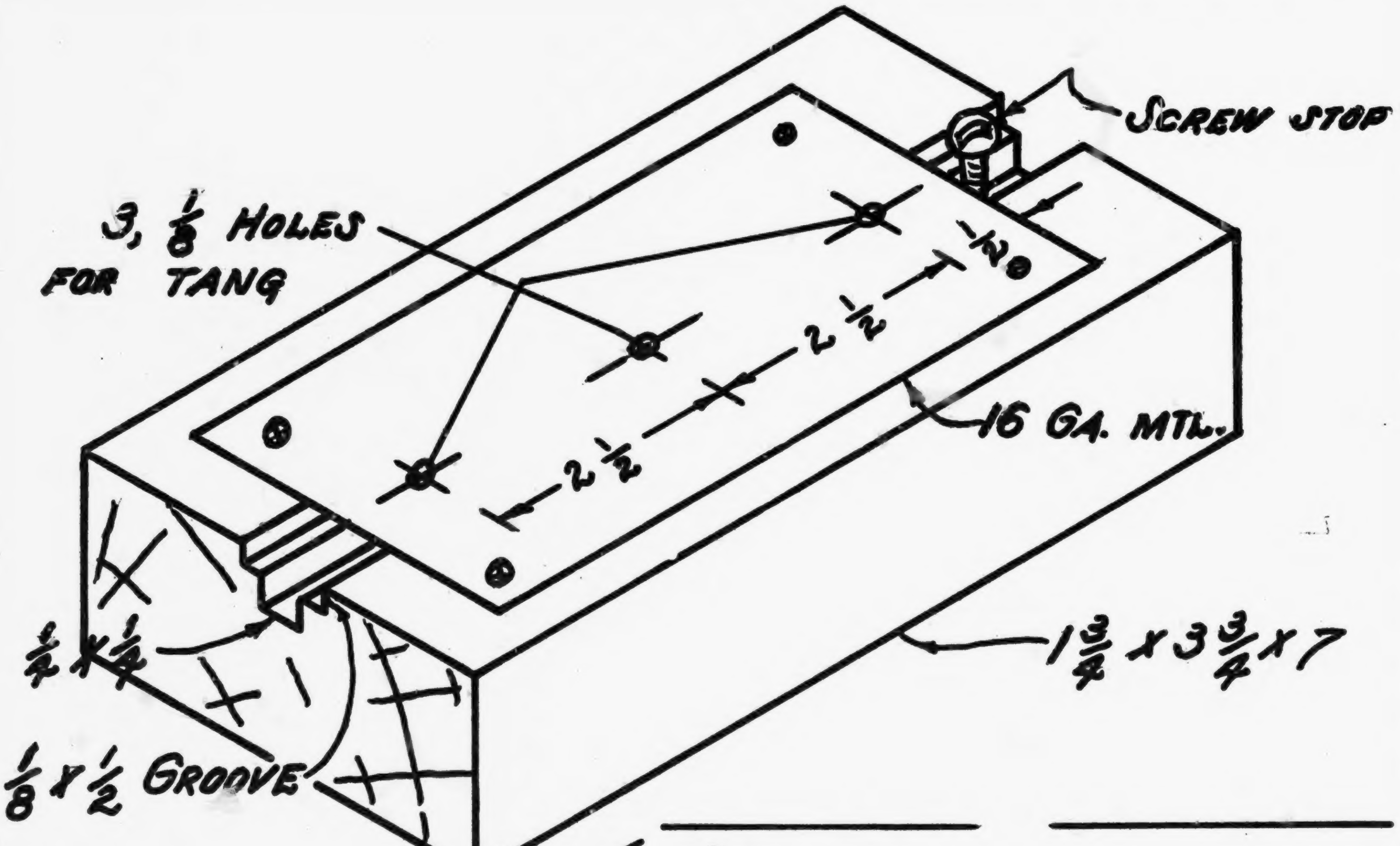
III. Pupil activities

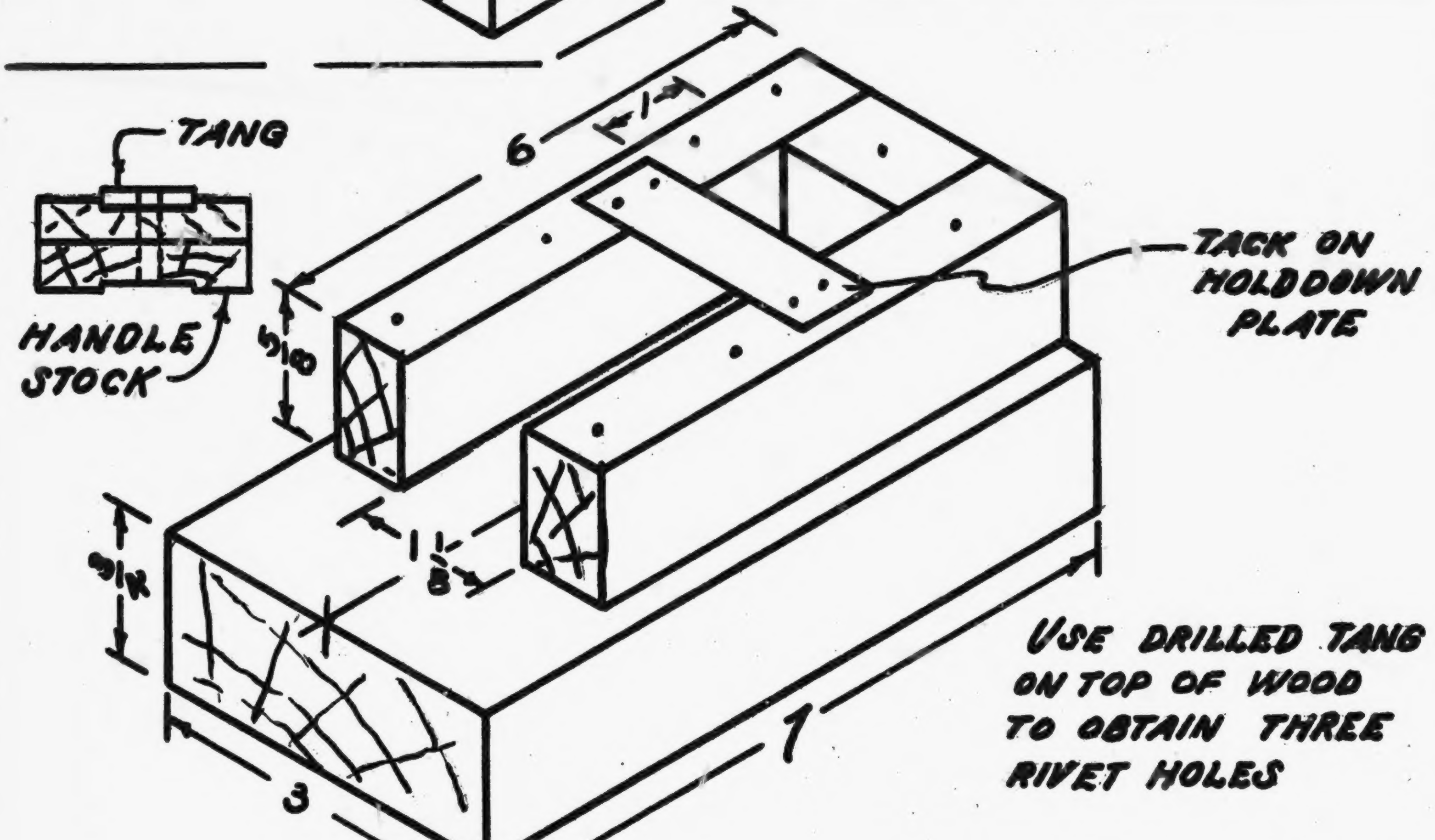
A. View specific jobs in the manufacture of a product

B. Participate in pupil personnel organization

Teaching Aids:

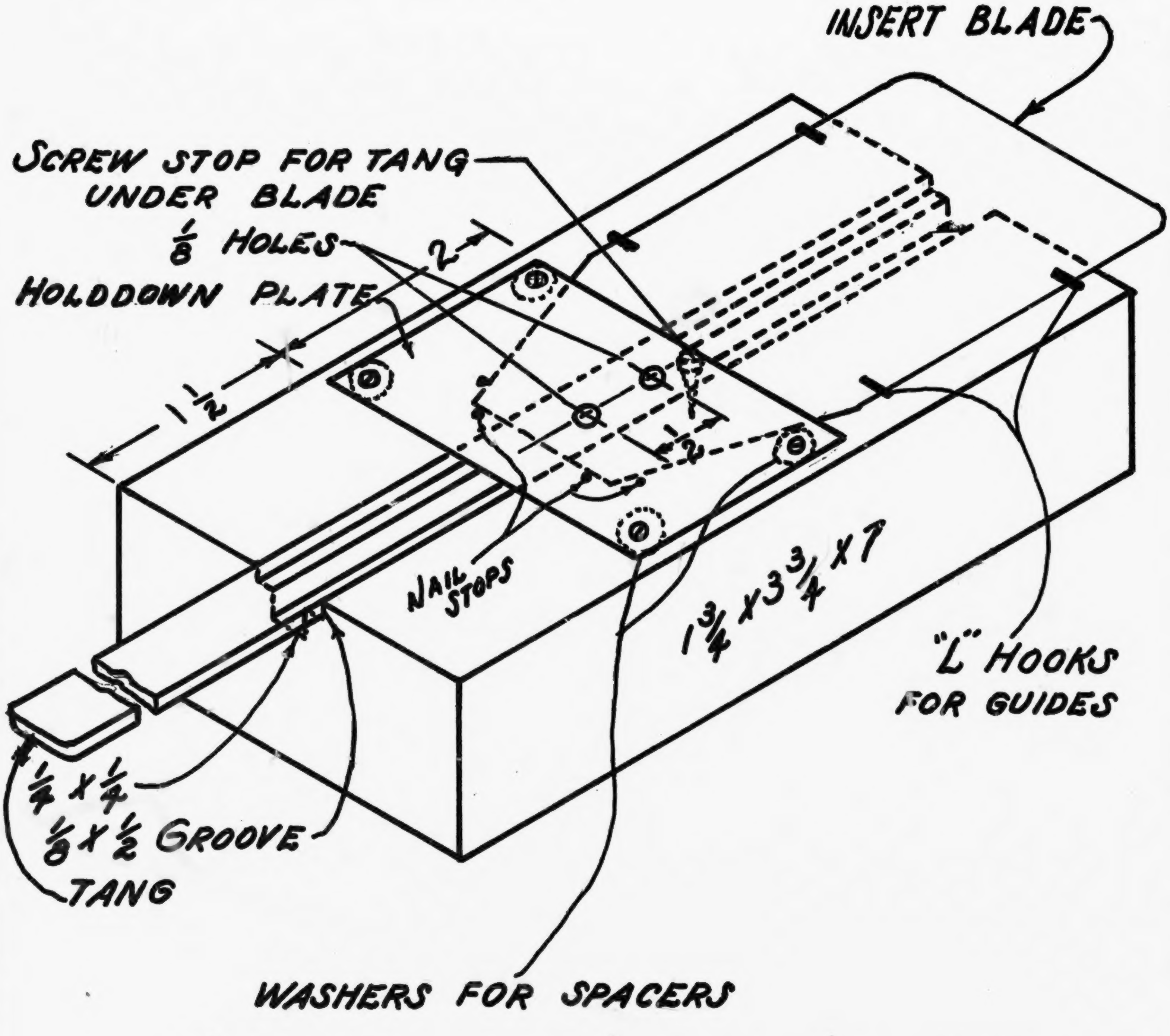
- Film: "The Factory"
- 16 mm. projector
- Overhead projector
- Sample jig and fixtures
- Floor plan of laboratory
- Flow chart
- Sample package of materials
- Sample product
- Drawings


3, $\frac{1}{8}$ HOLES FOR TANG
SCREW STOP
$\frac{1}{8}$
$2\frac{1}{2}$
$2\frac{1}{2}$
16 GA. MTL.
$\frac{1}{4}$ x $\frac{1}{4}$
$1\frac{3}{4}$ x $3\frac{3}{4}$ x 7
$\frac{1}{8}$ x $\frac{1}{2}$ GROOVE


6
1
TANG
HANDLE STOCK
$\frac{5}{8}$
TACK ON HOLDDOWN PLATE
$1\frac{1}{8}$
$\frac{3}{4}$
7
3

USE DRILLED TANG
ON TOP OF WOOD
TO OBTAIN THREE
RIVET HOLES

CAMPCRAFTERS, INC. GORHAM, ME.	HANDLE & TANG DRILLING JIGS	DR. BY R. Dean CK. BY A. Knowles

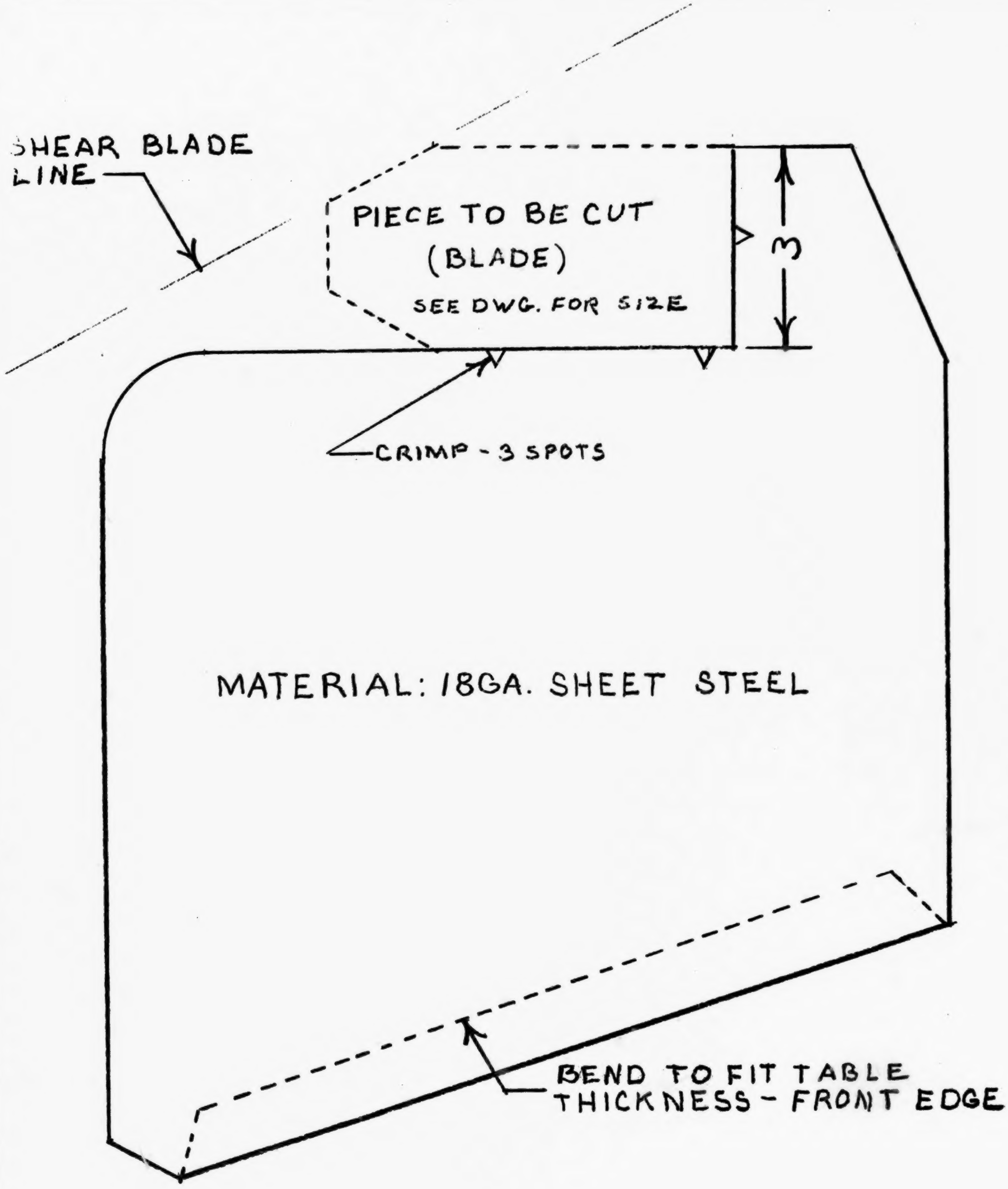

INSERT BLADE
SCREW STOP FOR TANG UNDER BLADE
$\frac{1}{8}$ HOLES
HOLDDOWN PLATE
2
$1\frac{1}{2}$
$\frac{1}{2}$
NAIL STOPS
$1\frac{3}{4} \times 3\frac{3}{4} \times 7$
"L" HOOKS FOR GUIDES
$\frac{1}{4} \times \frac{1}{4}$
$\frac{1}{8} \times \frac{1}{2}$ GROOVE
TANG
WASHERS FOR SPACERS

NOTE: ✓ MAKE BOTH $1\frac{3}{4}$ DRILL JIGS FROM SAME STOCK, CUT IN HALF AFTER PLOUGHING GROOVES.
✓ DRILL BOTH PIECES TOGETHER, TANG & BLADE

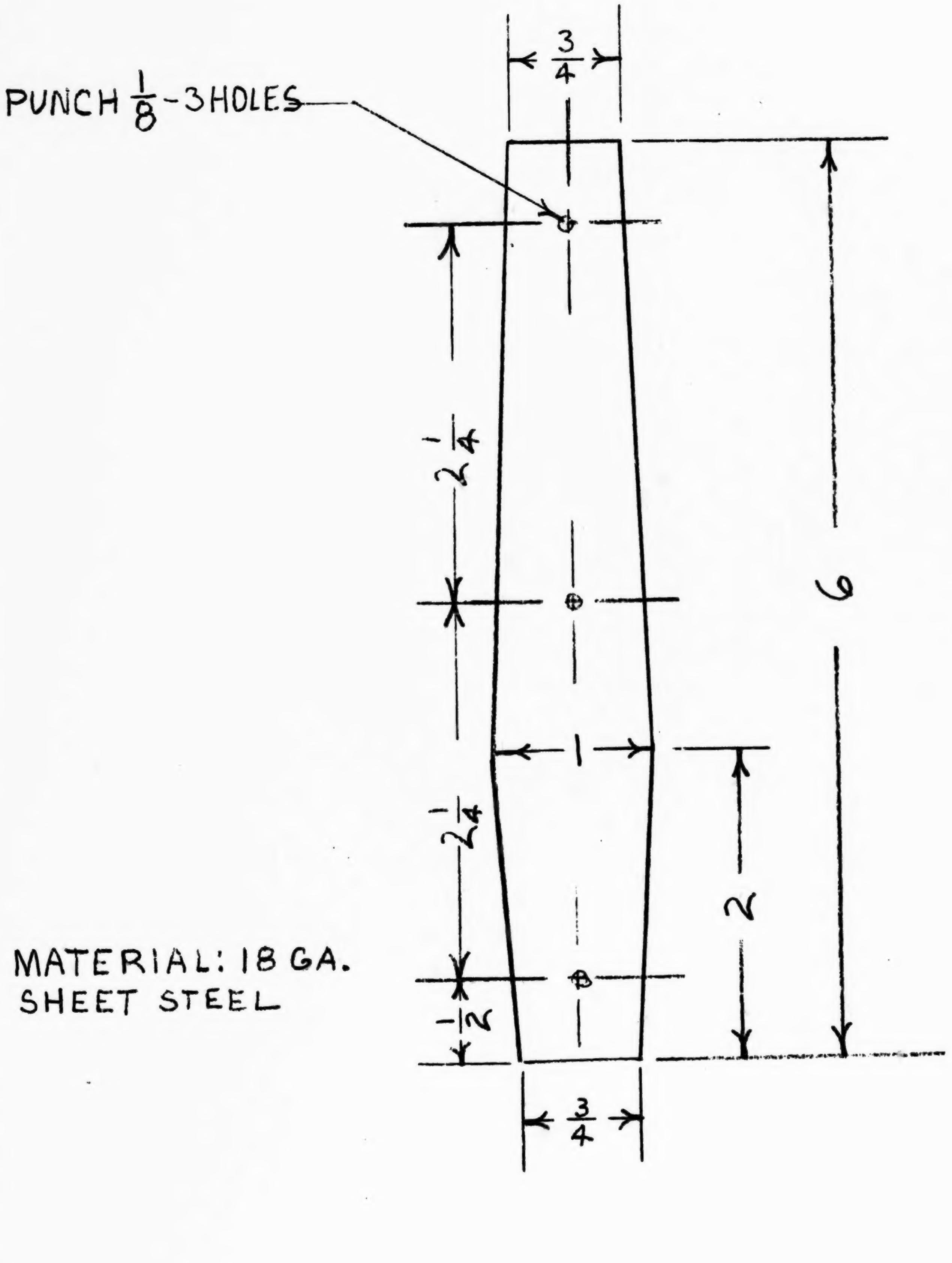
CAMPCRAFTERS, INC.
GORHAM, ME.

BLADE & TANG
DRILLING JIG

DR. BY
CK. BY

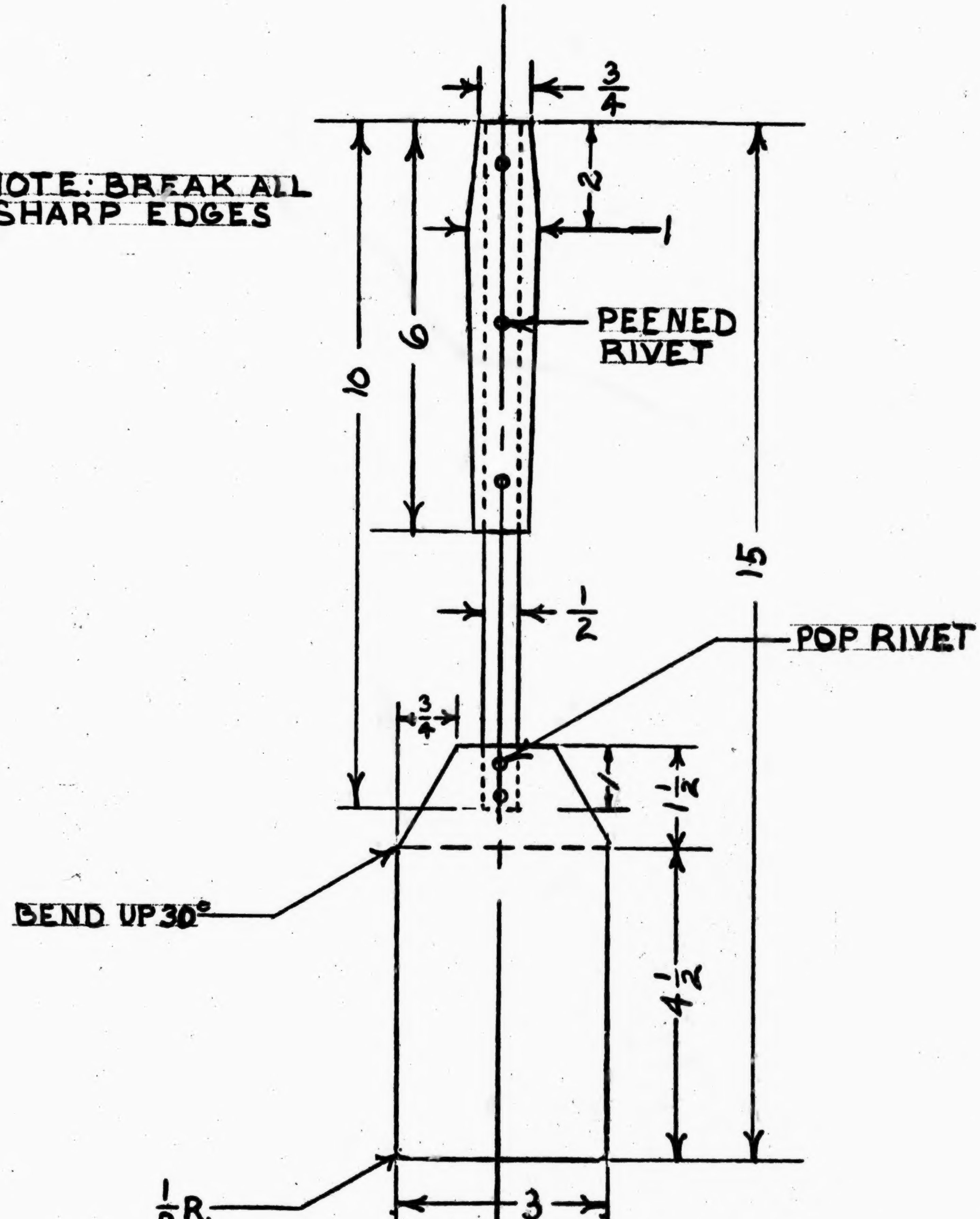

SHEAR BLADE LINE
PIECE TO BE CUT (BLADE)
SEE DWG. FOR SIZE
3
CRIMP - 3 SPOTS
MATERIAL: 18GA. SHEET STEEL
BEND TO FIT TABLE THICKNESS - FRONT EDGE

CAMPCRAFTERS, INC GORHAM, ME.	JIG FOR CUTTING BLADE ANGLE	DR. BY. CK. BY. R. J. Dean



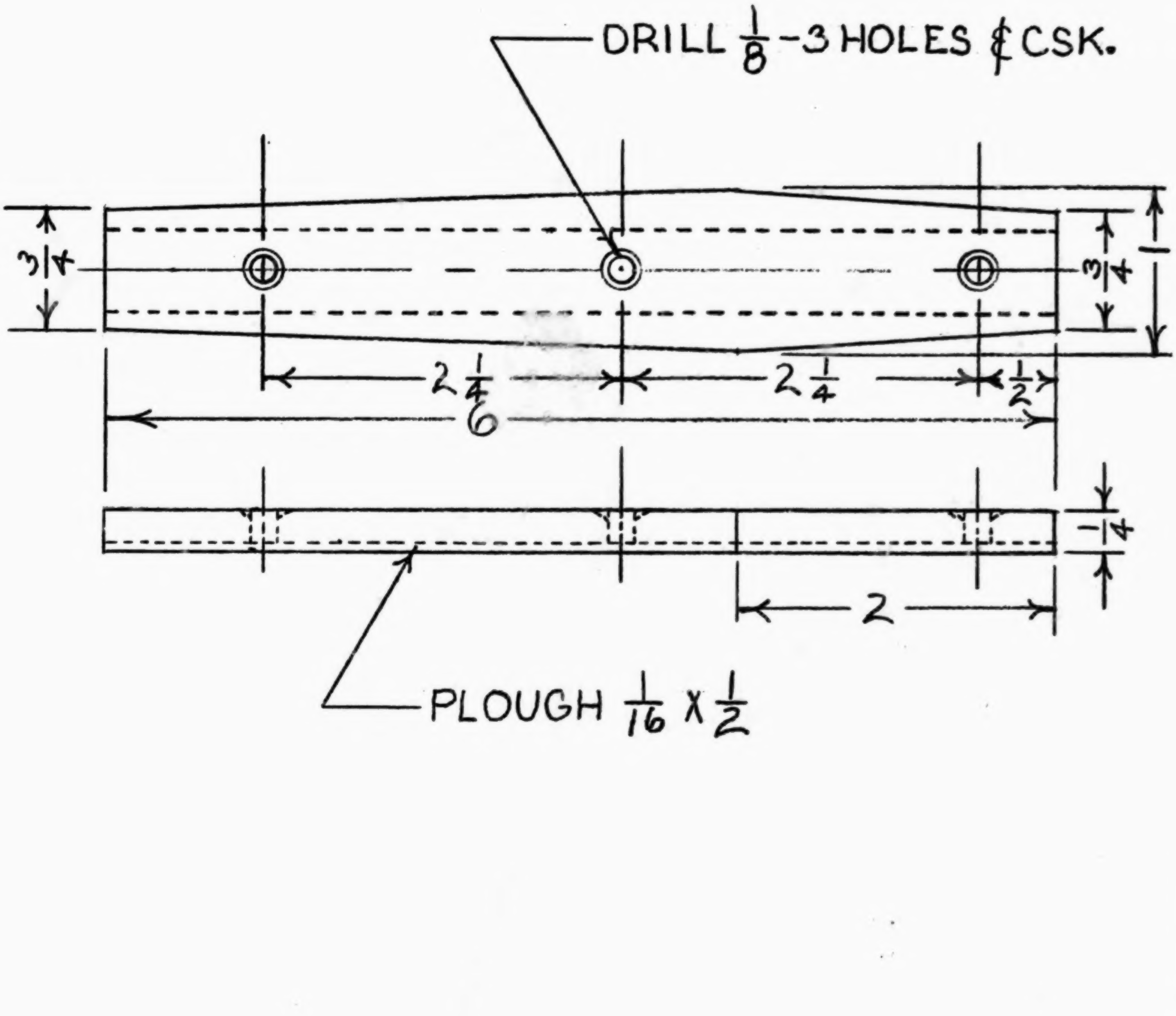
PUNCH $\frac{1}{8}$ - 3 HOLES
$\frac{3}{4}$
$2\frac{1}{4}$
6
1
$2\frac{1}{4}$
2
$\frac{1}{2}$
$\frac{3}{4}$
MATERIAL: 18 GA.
SHEET STEEL

CAMPCRAFTERS GORHAM, ME.	HANDLE SHAPE TEMPLATE	DR. BY. CK. BY.

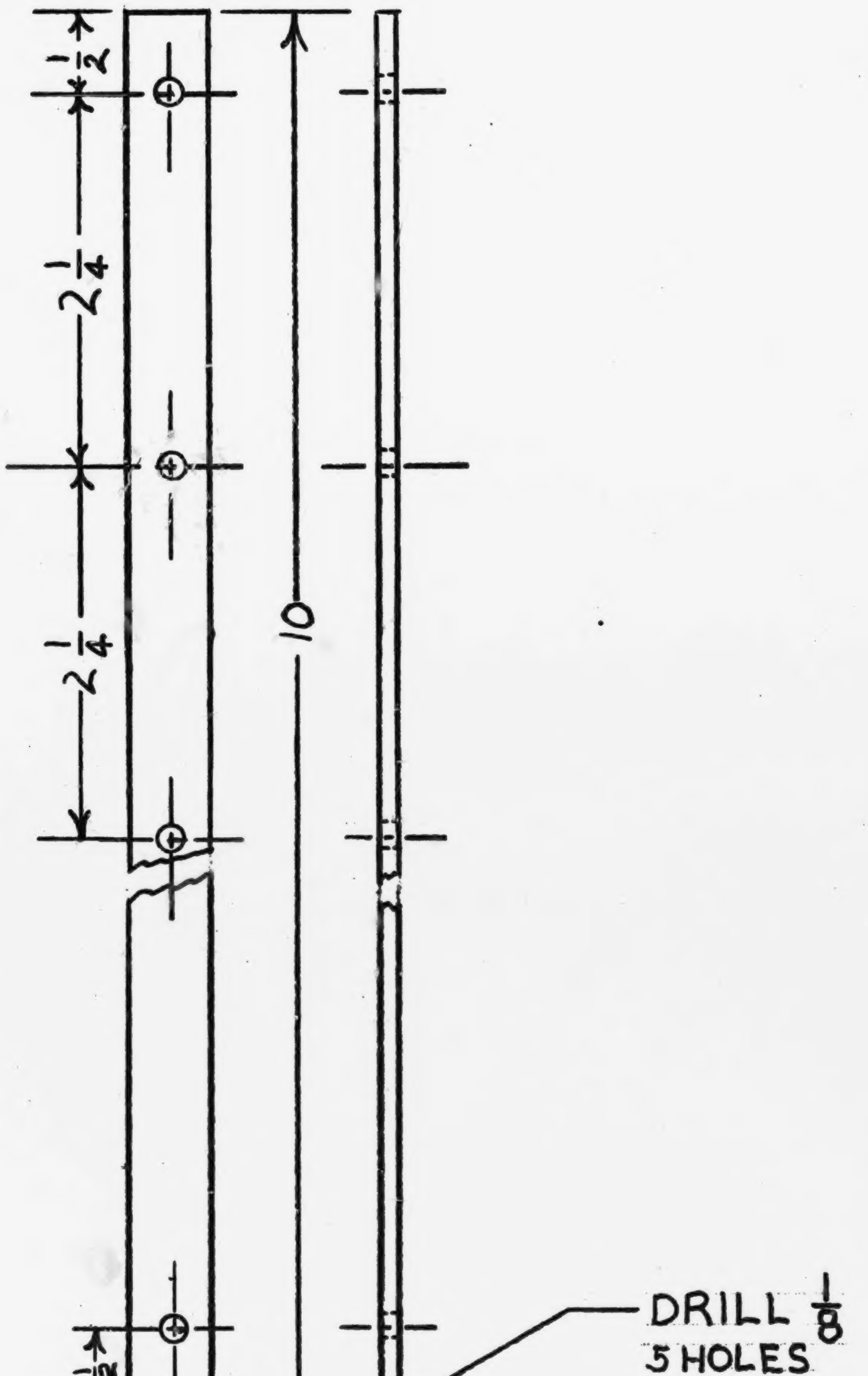

3/4
2
1
PEENED RIVET
10
6
15
1/2
POP RIVET
3/4
1
1 1/2
BEND UP 30°
4 1/2
1/8 R.
3

NOTE: BREAK ALL SHARP EDGES

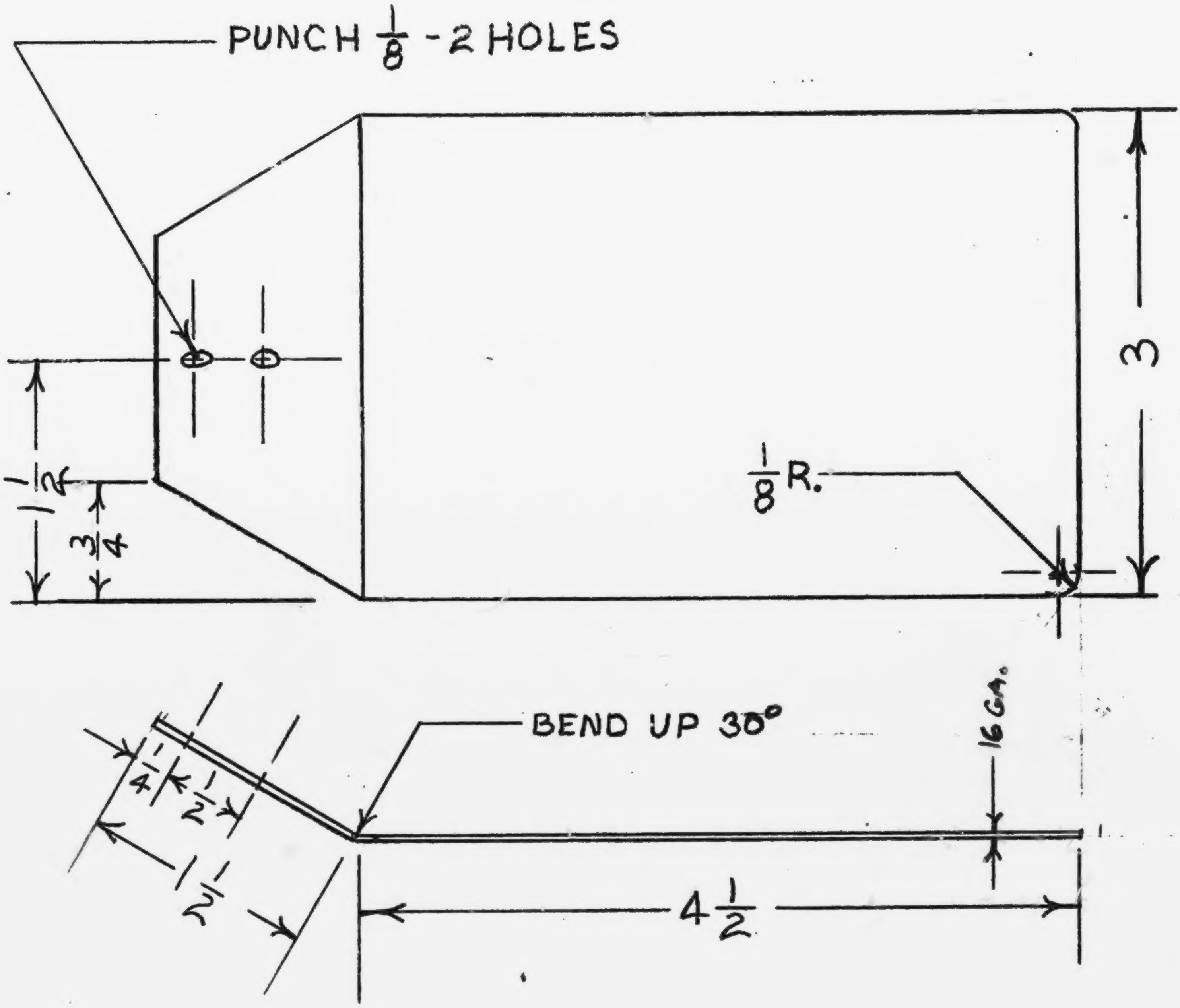
CAMPCRAFTERS GORHAM, ME.	SPATULA ASSEM. SCALE: 6"=1'-0"	DR. BY CK. BY


DRILL $\frac{1}{8}$ -3 HOLES & CSK.
$\frac{3}{4}$
$\frac{3}{4}$
1
$2\frac{1}{4}$
$2\frac{1}{4}$
$\frac{1}{2}$
6
$\frac{1}{4}$
2
PLOUGH $\frac{1}{16}$ X $\frac{1}{2}$

CAMPCRAFTERS GORHAM, ME.	HANDLE DETAIL SCALE: FULL	DR. BY. CK. BY.

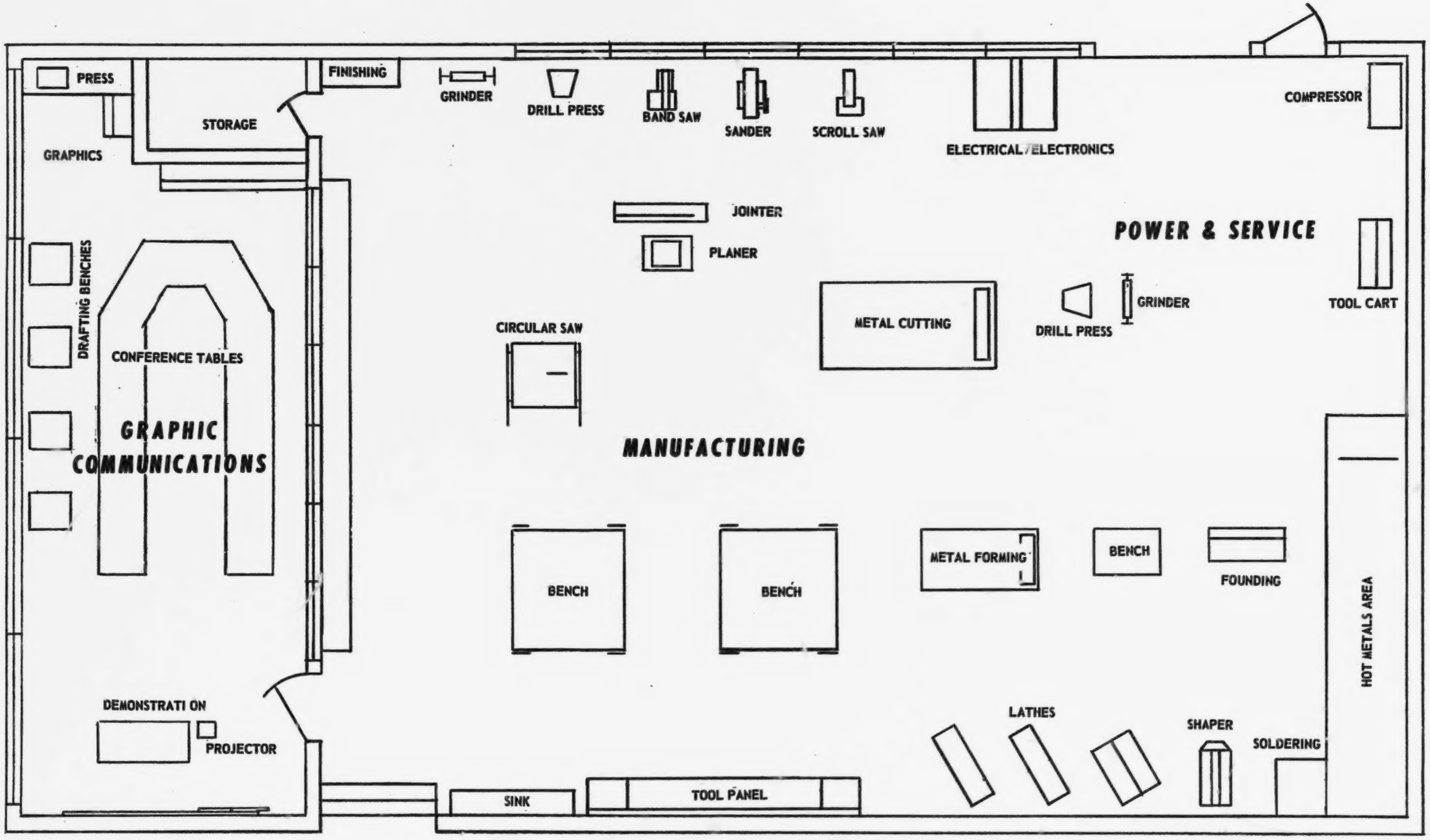

1/2
2 1/4
2 1/4
10
1/2
1/4
1/4
1/2
1/8
DRILL 1/8
5 HOLES

CAMPCRAFTERS GORHAM, ME.	TANG DETAIL SCALE: FULL	DR. BY. CK. BY. W L Findlen


PUNCH 1/8 - 2 HOLES
3
1/8 R.
1 1/2
3/4
BEND UP 30°
16 GA.
1/4
1/2
1 1/2
4 1/2

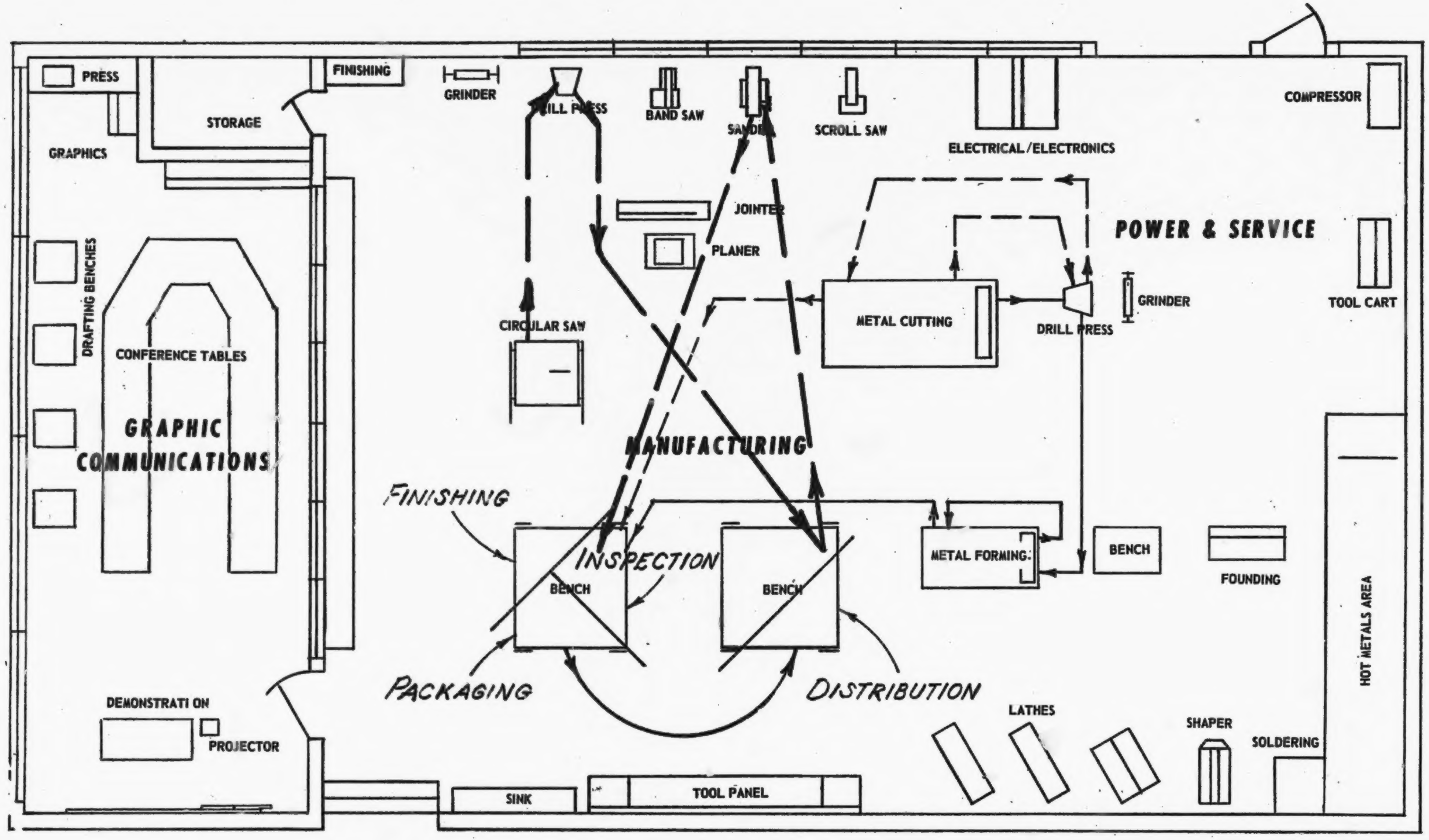
NOTE: BREAK ALL SHARP EDGES

CAMPCRAFTERS GORHAM, ME.	BLADE DETAIL SCALE: FULL	DR. BY. CK. BY A. Knowlen


PRESS
FINISHING
GRINDER
DRILL PRESS
BAND SAW
SANDER
SCROLL SAW
ELECTRICAL/ELECTRONICS
COMPRESSOR
STORAGE
GRAPHICS
JOINTER
PLANER
POWER & SERVICE
TOOL CART
GRINDER
DRILL PRESS
METAL CUTTING
DRAFTING BENCHES
CONFERENCE TABLES
GRAPHIC
COMMUNICATIONS
CIRCULAR SAW
MANUFACTURING
BENCH
BENCH
METAL FORMING
BENCH
FOUNDING
HOT METALS AREA
DEMONSTRATI ON
PROJECTOR
LATHES
SHAPER
SOLDERING
SINK
TOOL PANEL

LABORATORY OF INDUSTRIES

GORHAM STATE COLLEGE


PRESS
FINISHING
GRINDER
DRILL PRESS
BAND SAW
SANDER
SCROLL SAW
ELECTRICAL/ELECTRONICS
COMPRESSOR
STORAGE
GRAPHICS
JOINTER
PLANER
POWER & SERVICE
TOOL CART
DRAFTING BENCHES
CONFERENCE TABLES
CIRCULAR SAW
METAL CUTTING
DRILL PRESS
GRINDER
GRAPHIC COMMUNICATIONS
MANUFACTURING
FINISHING
INSPECTION
BENCH
BENCH
METAL FORMING
BENCH
FOUNDING
HOT METALS AREA
PACKAGING
DISTRIBUTION
DEMONSTRATI ON
PROJECTOR
LATHES
SHAPER
SOLDERING
SINK
TOOL PANEL

LABORATORY OF INDUSTRIES
GORHAM STATE COLLEGE

PRODUCTION FLOW CHART FOR SPATULA

——————— BLADE
– – – – – TANG
—— —— —— HANDLE

JOB ANALYSIS
FOR
PRODUCTION OF SPATULA

BLADE

1.	Cut angles	Shear	Janice Leavitt
2.	Drill rivet holes in blade, using jig	Drill press	Andrew Bent
3.	Bend 30 degree angle; remove burrs and file radius	Brake File	Nancy Fish (Foreman)

TANG

1.	File burrs and polish	File	Linda Arthur
2.	Drill handle holes and remove burrs	Drill press File	Mark Beede (Foreman)

HANDLE

1.	Drill holes	Drill press	Joe Ramsdell (Foreman)
2.	Countersink for riveting	Hand drill Countersink	
	Layout pattern on handle		Sherry Green
3.	Cut rivets and peen handle to tang	Ball peen hammer	John Hoyt
4.	Shape handle	Sander	Alan McLucas
5.	Hand sand	Sandpaper	Pamela Kirkpatrick

JOB ANALYSIS FOR PRODUCTION OF SPATULA (Continued)

ASSEMBLY

1. Pop rivet blade to tang	Pop riveter	Kristene Carpenter (Foreman)
2. Dip handle in oil for finish	Oil finish	Matt Skehan
3. Final inspection	Quality control	Penny Briggs

PACKAGING

1. Put label in bag		
2. Put spatula in bag		
3. Tie bag		
4. Box for shipping		Group

Title: Line and Staff Organization in a Corporate Manufacturing Industry

Presentation:

I. Need for organization

A. Number of people

B. Number of operations

II. Levels of line organization

A. Board of directors

B. President

C. Department managers

1. Engineering
2. Market and sales
3. Manufacturing
4. Finance
5. Personnel

D. First line supervisors

E. Workers or employees

III. Staff organization

A. Advisor

B. Control

C. Service

D. Coordinating

IV. Organization of "Campcrafters, Inc."

A. Line organization

B. Staff organization

V. Pupil personnel organization

References:

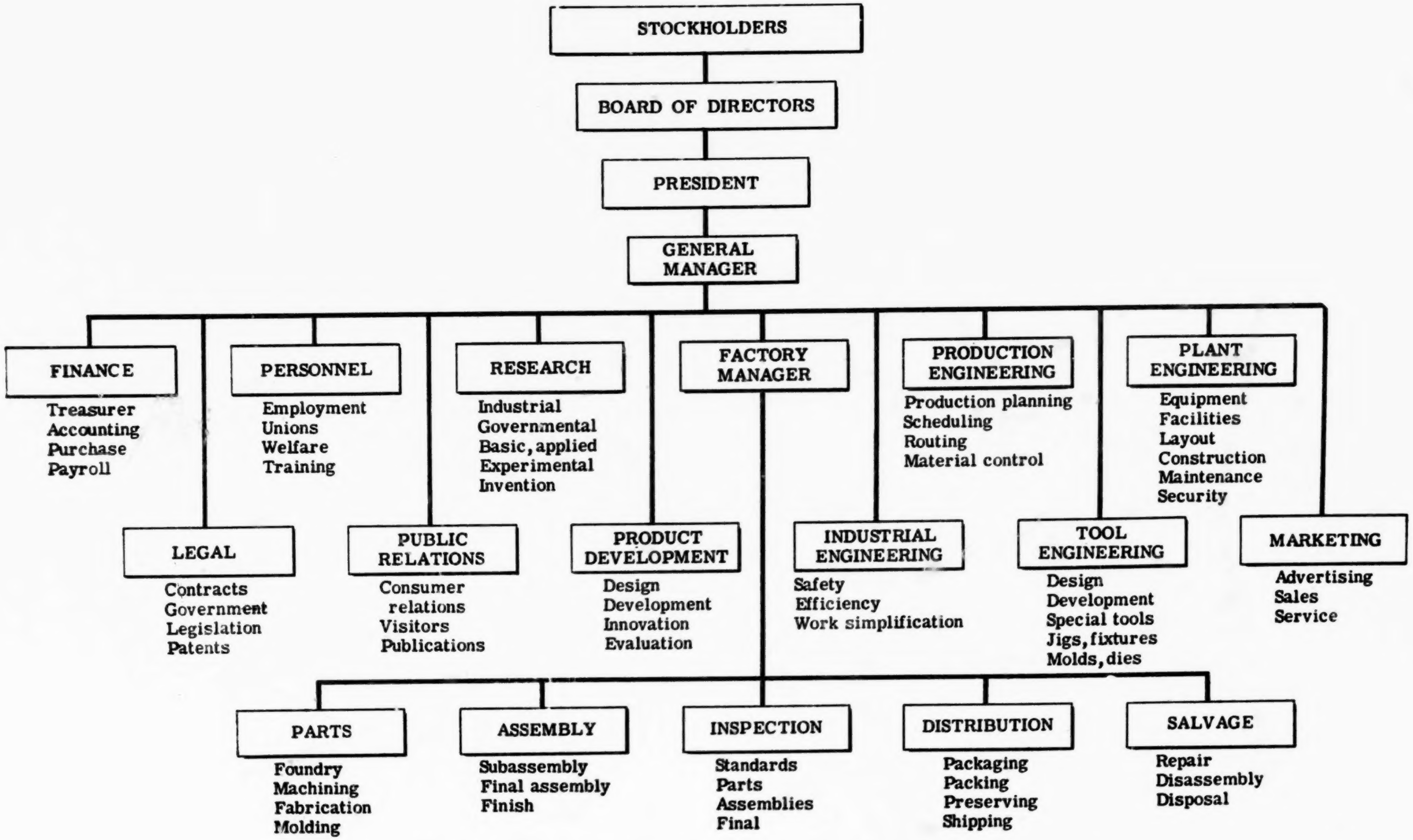
Amrine, Ritchey, Hulley, Manufacturing Organization and Management, Chapter 3

Olson, Delmar, Industrial Arts for the General Shop, Chapter 1

Teaching Aids:

Overhead Transparencies

1. Organization of a Typical Manufacturing Organization
2. Organization of Campcrafters, Inc.
3. Mobile - Elements of Industry


STOCKHOLDERS
BOARD OF DIRECTORS
PRESIDENT
GENERAL MANAGER
FINANCE
Treasurer
Accounting
Purchase
Payroll
LEGAL
Contracts
Government
Legislation
Patents
PERSONNEL
Employment
Unions
Welfare
Training
PUBLIC RELATIONS
Consumer relations
Visitors
Publications
RESEARCH
Industrial
Governmental
Basic, applied
Experimental
Invention
PRODUCT DEVELOPMENT
Design
Development
Innovation
Evaluation
FACTORY MANAGER
INDUSTRIAL ENGINEERING
Safety
Efficiency
Work simplification
PRODUCTION ENGINEERING
Production planning
Scheduling
Routing
Material control
TOOL ENGINEERING
Design
Development
Special tools
Jigs, fixtures
Molds, dies
PLANT ENGINEERING
Equipment
Facilities
Layout
Construction
Maintenance
Security
MARKETING
Advertising
Sales
Service
PARTS
Foundry
Machining
Fabrication
Molding
ASSEMBLY
Subassembly
Final assembly
Finish
INSPECTION
Standards
Parts
Assemblies
Final
DISTRIBUTION
Packaging
Packing
Preserving
Shipping
SALVAGE
Repair
Disassembly
Disposal

Typical functional structure of manufacturing industries.

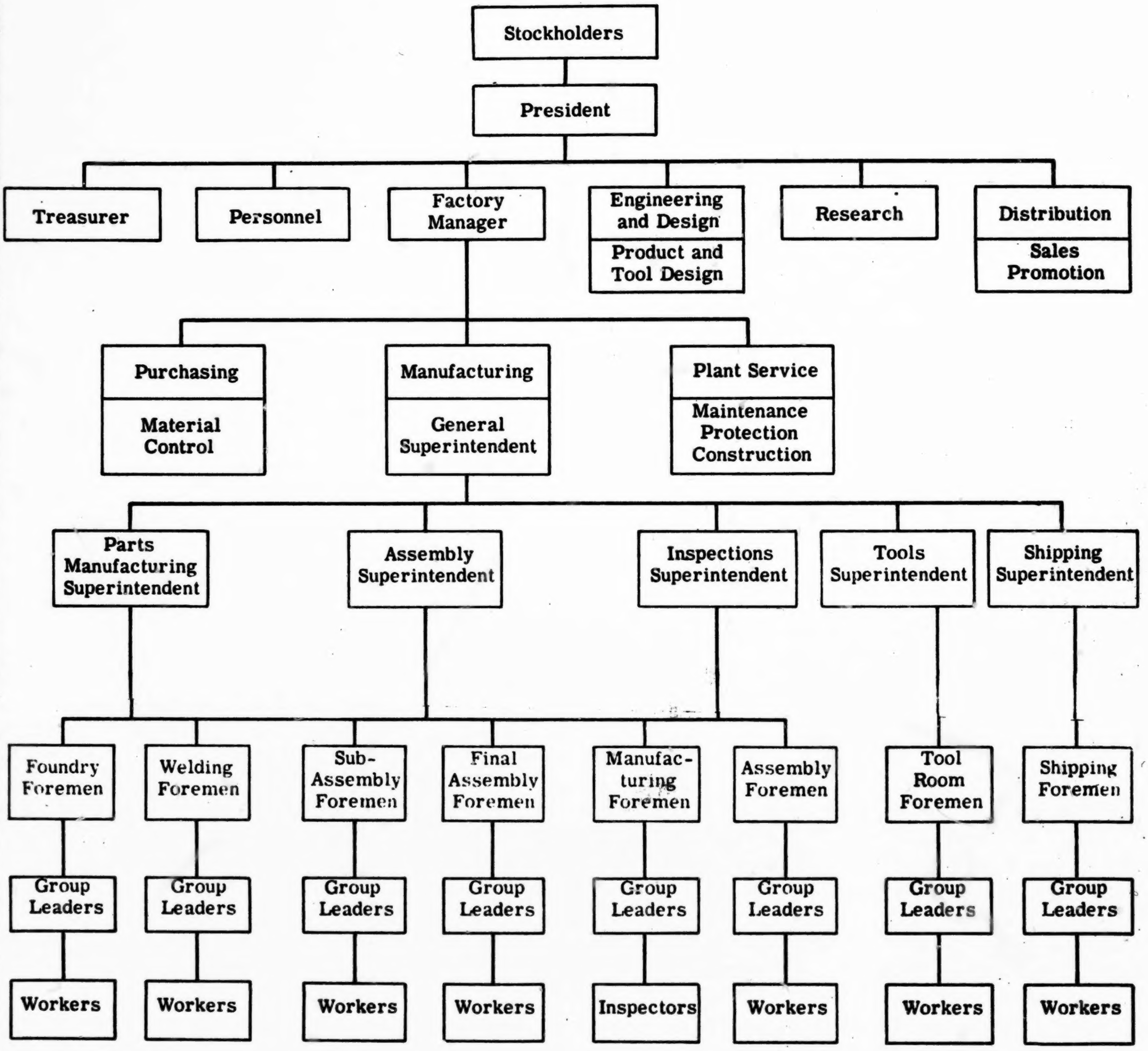
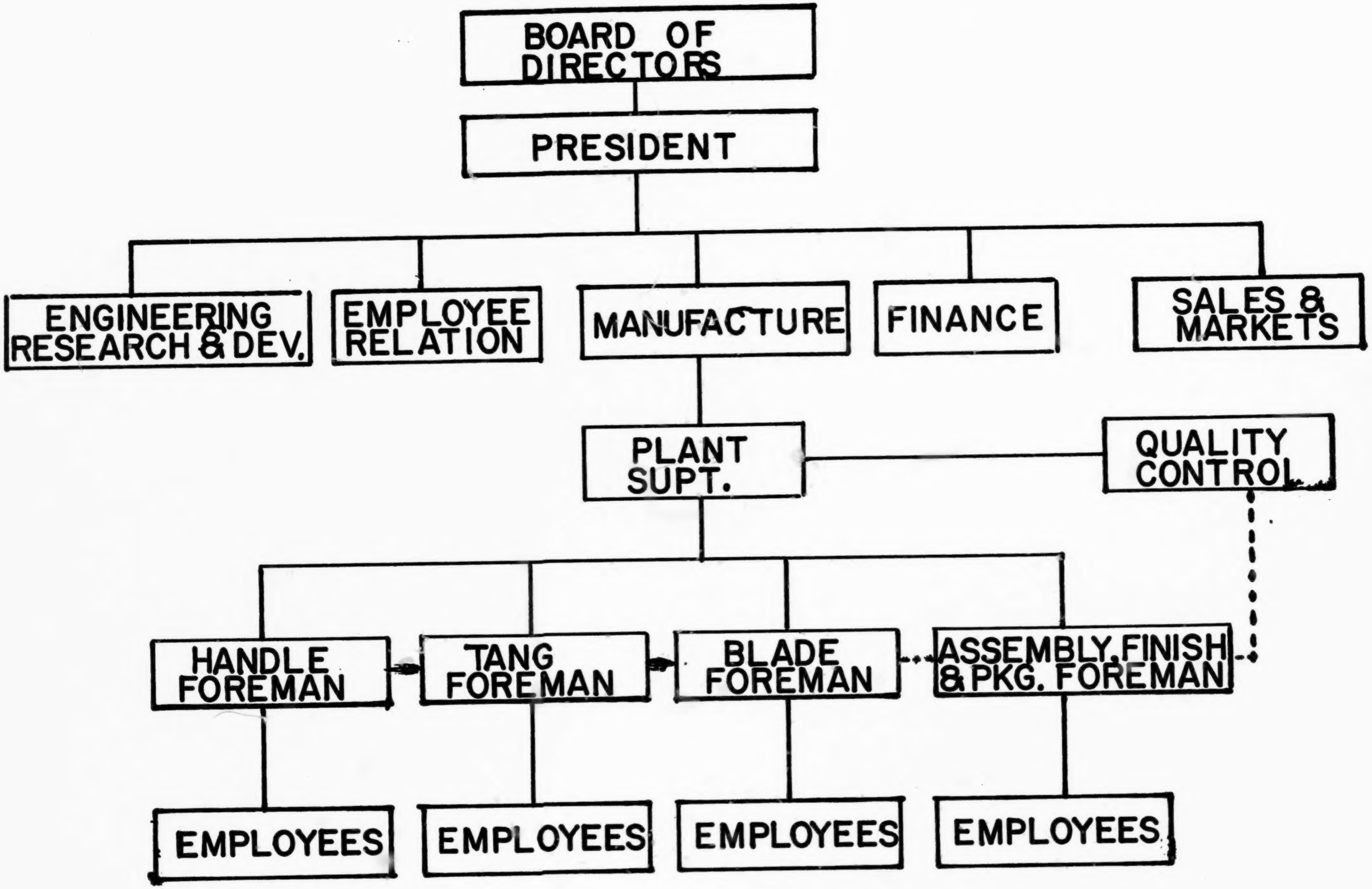

Stockholders
President
Treasurer
Personnel
Factory Manager
Engineering and Design
Product and Tool Design
Research
Distribution
Sales Promotion
Purchasing
Material Control
Manufacturing
General Superintendent
Plant Service
Maintenance
Protection
Construction
Parts Manufacturing Superintendent
Assembly Superintendent
Inspections Superintendent
Tools Superintendent
Shipping Superintendent
Foundry Foremen
Welding Foremen
Sub-Assembly Foremen
Final Assembly Foremen
Manufacturing Foremen
Assembly Foremen
Tool Room Foremen
Shipping Foremen
Group Leaders
Group Leaders
Group Leaders
Group Leaders
Group Leaders
Group Leaders
Group Leaders
Group Leaders
Workers
Workers
Workers
Workers
Inspectors
Workers
Workers
Workers

Fig. 1.3. Flow chart showing the personnel organization of a manufacturing industry. The stockholders are the owners of the company. They have invested their money to buy stock. They elect a board of directors, and the directors appoint the president, who is responsible for operating the plant. Small groups of workers are supervised by group leaders. The group leaders are responsible to foremen, who in turn are responsible to their superintendent, and so on up the line. In a large industry there may be fifty or more separate departments, each with a specific type of work. The activities of all these departments, which may include many thousands of employees, must be accurately coordinated so that the products can flow off the production line on schedule.

Delmar W. Olson, Industrial Arts for the General Shop

ORGANIZATION OF CAMPCRAFTERS, INC.


BOARD OF DIRECTORS
PRESIDENT
ENGINEERING RESEARCH & DEV.
EMPLOYEE RELATION
MANUFACTURE
FINANCE
SALES & MARKETS
PLANT SUPT.
QUALITY CONTROL
HANDLE FOREMAN
TANG FOREMAN
BLADE FOREMAN
ASSEMBLY, FINISH & PKG. FOREMAN
EMPLOYEES
EMPLOYEES
EMPLOYEES
EMPLOYEES

THE INDUSTRY MOBILE

This mobile was developed to depict the scope and divisions of industry and the involvement of the students and participants in the NDEA Institute at Gorham State College of the University of Maine during the summer of 1968.

The umbrella represents industry. Extending from five of the ribs are the functions of industry (Engineering, Finance, Marketing, Production, and Personnel) giving the feeling that if one of the ribs (or functions) were missing, the umbrella (Industry) would collapse. Hanging from the remaining ribs are: 1) The brochure explaining the NDEA Institute representing the governments involvement, 2) A dollar depicting the fact that money is needed for the institute, 3) the seal of Gorham State College depicting the fact that Dr. John Mitchell and the staff of the Industrial Education Center are involved with the institute and actively engaged in the teaching of Industry and Industrial Arts.

At the end of the handle one finds a product manufactured by the students of one of the teams of the institute. This represents the ultimate outcome of all manufacturing industries.

This mobile now hangs in the main lobby of the Industry and Technology Center of Gorham State College, Gorham, Maine.

Title: Functions and Activities of the Finance Division of a Corporate Manufacturing Industry

Presentation:

I. Stocks

  A. A share in the corporation

  B. Voting rights of a stockholder

  C. Corporation control

    1. Mock election of chairman of the board to illustrate the one share-one vote idea
    2. Further stock issues
      a. Advantage - larger working capital
      b. Disadvantage - dilution of ownership

II. Bonds

  A. A method of borrowing money

  B. Fixed interest

  C. Comparison with stocks

    1. Bond interest paid first
    2. Stock income determined by corporation profits - not a fixed amount

III. Security exchanges

  A. Listed corporations must meet minimum standards

  B. Meeting place for brokerage firms

IV. Wages and salaries - comparison of job opportunities

  A. White collar workers - salaried office workers

  B. Skilled workers - the trained technician

  C. Semi-skilled workers - machine operators

  D. Unskilled workers - little or no training

V. Weekly time sheet

  A. Sheets kept by employees

  B. Automatic time clock and card

VI. Accounting divisions responsibilities in the payroll

A. Computation of payroll

B. Payroll deductions

1. Income tax forms, W-2, W-4, 1040
2. Social security - employer and employee each pay
    a. Old age insurance
    b. Medicare
3. Other possible deductions
    a. Check-off of union dues
    b. Hospital insurance (some companies)
    c. Voluntary deductions
        1) Government bonds
        2) Credit unions
        3) Life insurance
        4) Charity
4. Yearly totals to date - W-2 form

C. Workmens Compensation - paid by employer

VII. Pupil activity

A. Fill out time sheet

B. Compute payroll with standard deductions

C. Fill out payroll check, using proper form

D. Purchase shares of stock in a mock corporation

E. Participate in stockholders' meeting

F. Elect the chairman of the board of a mock corporation

References:

Amrine, Ritchey and Hulley, Manufacturing Organization and Management, pp. 453-4, 456-460

Your New Social Security Law Report, Including Medicare, Clifton, New Jersey, 1967, Marshall Publications

Teaching Aids:

Overhead Transparencies

1. A section of the daily stock report
2. W-2 form
3. W-4 form
4. 1040 form
5. Weekly time sheet
6. 100 pennies (to show percent of deductions)

Newspaper article on a local corporation's sale of stock

Copies of a share of stock in the pupils' company

Payroll checks - with deduction voucher attached

Weekly time sheets - for each pupil to fill out

New York Stocks At 11 A.M.

NEW YORK (UPI)—Stocks:

Air Reduction	31⅜	+ ¼
Allegheny Ludlum St	55⅞	
Allied Chemical	36½	
Allis Chalmers	29	— ⅛
Alcoa	68	— ½
American Can	50½	— ¼
American Cyanamid	28⅛	+ ⅜
American Motors	12⅝	— ⅛
American Tel & Tel	50⅞	+ ¼
Anaconda	48⅞	—1⅛
Armco Steel	51⅜	+ ⅛
Bethlehem Steel	30	— ¼
Boeing Aircraft	67¾	+1
Borden	33⅜	+ ¼
Chesapeake & Ohio	67	
Chrysler	68⅜	+ ½
Coca Cola	77	+1⅛
Consolidated Nat Gas	30¼	
Continental Can	58	+ ⅜
Corn Products	40¾	+ ⅜
Crane	48	+ ¼
Curtiss Wright	27¼	+ ⅝
Dow Chemical	80⅜	— ⅜
Dresser	37	
DuPont	164¼	+ ¼
Eastern Airlines	34⅛	+ ⅛
Eastman	78⅞	— ⅛
Ford	[illegible]	+ ¼
General Dynamics	[illegible]⅝	— ⅜
General Electric	86	+ ⅛
General Motors	83⅞	+ ⅜
Greyhound	24⅝	+ ⅛
Gulf Oil	80¾	
Hershey	29¾	— ⅜
Ingersol Rand	48⅛	+ ⅛
International Harv	33⅞	+ ⅜
International Nickel	100¾	+ ¼
International Tel&Tel	56	+ ¼
Interpace	31⅛	
Jones & Laughlin	67⅜	+ ⅛
Joy Manufacturing	32	— ¼
Koppers	34¼	— ⅛
Kresge	39	— ⅜
Kroger	30⅞	+ ⅛
Latrobe Steel	28⅜	+ ½
LOF Glass	63	— ⅜
Mc Don Dgls	52⅛	
MMM	107⅜	+ ¼
Mobil Oil	50¼	+ ⅛
Montgomery Ward	32⅜	
Motorola	145	+1¼
Murphy Co	30⅞	+ ⅛
National Aviation	43	+ ⅛
National Dist	40¾	— ⅞
North American Rock	37½	+ ¼
Pan American	23	— ¼
Penney	81	
Penn D Cm	27⅝	+1¼
Penn NY Central	75½	—1
PepsiCo	47⅞	— ⅜
Polaroid	113½	+ ⅜
PPG Industries	82½	— ⅛
Procter Gamble	95⅝	— ¼
RCA	47½	— ⅛
Reading	24¼	+ ⅜
Sears Roebuck	72	— ¼
Simmons	47	— ⅝
Sperry Rand	48⅝	+1⅛
Standard Oil Cal	65⅞	
Standard Oil NJ	74¼	— ⅛
Standard Oil Ohio	66½	— ¼
Stewart Warner	36½	— ⅛
Texaco	80¾	— ⅛
Timken Roller Brng	38¾	— ¼
Trans World Airlines	46¾	— ¼
Union Carbide	44⅜	+ ⅛
United Airlines	43	— ¼
United Gas Imp	23¾	
Uniroyal	58⅜	— ⅜
US Smelting	64½	+ ⅜
US Steel	39⅜	— ¼
W Va P & P	54¼	+ ¼
Western Union	48¼	+ ⅝
Westinghouse Elec	75¼	+ ¼
Wheeling Steel	30¼	— ¼
White Motors	48⅛	— ½
Winn dx	33¼	+ ½
Xerox Corp	284½	+ ¾
Youngstown S & T	37⅜	+ ⅜
Zenith	55⅛	

1

WAGE AND TAX STATEMENT 1965

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above.

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1965	Other compensation[2] paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965	

Type or print EMPLOYEE'S social security number→

Type or print EMPLOYEE'S name and address above.

[1] Before payroll deductions or "sick pay" exclusions.

[2] The block marked "Other compensation" is for use in reporting salary or other compensation which was not subject to withholding and which was heretofore reported on Form 1099. In 1965 this type of income may be shown on either the W–2 or the 1099 (but not on both).

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared........................ ....

FORM W–2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

c59—16—78793-1

UNIVERSITY OF MAINE, ORONO, MAINE

STATE COLLEGES
PAYROLL ACCOUNT

SUBSISTENCE	GROSS PAY	F.I.T.	F.I.C.A.	AMOUNTS	TYPE OF DEDUCTION
	100.00	14.51		85.49	
		8/14			

DEDUCTIONS →

PERIOD ENDING	YEAR-TO-DATE EARNINGS	YEAR-TO-DATE F.I.T.	YEAR-TO-DATE F.I.C.A.	NET AMOUNT	
6 28 68	100.00	14.51		85.49	

DEDUCTION CODE

1. STATE GROUP LIFE INSURANCE
2. BLUE CROSS
3. M.S.E.A.
4. STATE PENSION.
5. STATE SURVIVORS BENEFITS
6. R.A.A.F.
7. T.I.A.A.—C.R.E.F.
8. UNION MUTUAL HOSPITAL INSURANCE
9. UNION MUTUAL LIFE INSURANCE
10. MISCELLANEOUS.

STATEMENT OF EARNINGS
AND DEDUCTIONS

[redacted]

KEEP THIS STUB FOR YOUR RECORDS

WAGE AND TAX STATEMENT 1965

Type or print EMPLOYER'S identification number, name, and address above.

Copy B—To be filed with employee's tax return

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1965	Other compensation[2] paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965	

Type or print EMPLOYEE'S social security number →

Type or print EMPLOYEE'S name and address above.

[1] Before payroll deductions or "sick pay" exclusions.

[2] The block marked "Other compensation" is for use in reporting salary or other compensation which was not subject to withholding and which was heretofore reported on Form 1099. Add this item to wages in figuring the amount to be reported as wages and salaries on your income tax return.

This is not a tax return but you must file it with Form 1040A, or Form 1040. See instructions on other side and on back of Copy C.

FOR USE OF INTERNAL REVENUE SERVICE

Employee's copy and employer's copy compared.......................... ------------------

FORM W-2—U.S. Treasury Department, Internal Revenue Service

c59—16—78793-1

NOTICE TO EMPLOYEE:

1. **Income Tax Wages.**—This statement is important. It must be filed with your U.S. Income Tax Return for 1965. If your social security number, name, or address is stated incorrectly, correct the information on copy B and notify your employer.
2. **Social Security Wages.**—If your wages were subject to social security taxes, but are not shown, your social security wages are the same as wages shown under "INCOME TAX INFORMATION," but not more than $4,800.
3. **Credit For F.I.C.A. Tax.**—If more than $174.00 of F.I.C.A. (social security) employee tax was withheld during 1965 because you received wages from more than one employer, the excess should be claimed as a credit against income tax. See instructions with your income tax return.

U.S. GOVERNMENT PRINTING OFFICE c59—16—78793-1

WAGE AND TAX STATEMENT 1965

Type or print EMPLOYER'S identification number, name, and address above.

Copy C—For employee's records

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1965	Other compensation[2] paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965[3]	

Type or print EMPLOYEE'S social security number→

Type or print EMPLOYEE'S name and address above.

[1] Before payroll deductions or "sick pay" exclusions.

[2] The block marked "Other compensation" is for use in reporting salary or other compensation which was not subject to withholding and which was heretofore reported on Form 1099. Add this item to wages in figuring the amount to be reported as wages and salaries on your income tax return.

[3] If your wages were subject to social security taxes, but are not shown, your social security wages are the same as wages shown under "Income Tax Information," but not more than $4,800.

Keep this copy as part of your tax records.

FORM W-2—U.S. Treasury Department, Internal Revenue Service

c59—16—78793-1

INSTRUCTIONS FOR FILING U.S. INCOME TAX RETURN

Who Must File.—If your income in 1965 was $600 or more ($1,200 if 65 years of age or over), or your net earnings from self-employment were $400 or more, you must file an income tax return. Forms may be obtained from the District Director of Internal Revenue, your employer, bank, or post office.

A single person with income of less than $600 ($1,200 if 65 years of age or over) should file a return to get a refund if tax was withheld. A married person with income less than her(his) own personal exemption(s) should file a joint return with husband or wife to get the smaller tax or larger refund. To assure any benefit of the split-income provisions, a married couple should file a joint income tax return.

Filing on Form 1040A.—Form 1040A may be used if your gross income (or the combined income of husband and wife) was less than $10,000 and consisted entirely of wages reported on Wage and Tax Statements (Forms W-2) and not more than $200 of dividends, interest, and other wages not subject to withholding.

If you file Form 1040A and your income is less than $5,000, you may figure your own tax or let the Internal Revenue Service do it for you. If your income is $5,000 or more but less than $10,000, you must use the standard deduction and compute your own tax. The use of the tax table or the standard deduction eliminates the need to list contributions, interest, taxes, losses, medical expenses, child care expenses, and certain miscellaneous deductions. The tax tables and tax computation schedule are provided in Form 1040A instructions for this purpose. If you compute your tax any balance due must be paid in full with the return. If the Service computes the tax for you and there is an underpayment, a bill will be sent to you. In any case where there is an overpayment a refund check will be sent to you.

File Form 1040 instead of Form 1040A if—(1) you had income from sources other than wages, dividends, and interest, (2) either husband or wife itemizes deductions, (3) you claim the status of head of household or surviving husband or wife, (4) you claim retirement income credit, (5) you claim "sick pay" exclusion for an amount included in wages shown on this form, or (6) you claim deductions for travel, moving, transportation, or "outside salesman" expense.

Filing on Form 1040.—Form 1040 may be used by all taxpayers and is designed to report all types of income and deductions.

U. S. GOVERNMENT PRINTING OFFICE c59—16—78793-1

WAGE AND TAX STATEMENT 1965

Copy D—For employer

Type or print EMPLOYER'S identification number, name, and address above.

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION		
Federal income tax withheld	Wages[1] paid subject to withholding in 1965	Other compensation paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965	

Type or print EMPLOYEE'S social security number ⟶

[1] Before payroll deductions or "sick pay" exclusions.

EMPLOYER: This copy is provided for your convenience in keeping your withholding records.

Type or print EMPLOYEE'S name and address above.

FORM W-2—U.S. Treasury Department, Internal Revenue Service

c59—16—78793-1

TO EMPLOYER:

1. Prepare this form for each employee (*a*) from whom income tax has been withheld during the year or (*b*) whose wages, for purposes of income tax withholding, exceeded the amount of one withholding exemption for any payroll period (even though no income tax was withheld).

2. Fill in—(*a*) Your identification number, name, and address.

   (*b*) The amount of income tax deducted and withheld. If no amount was deducted and withheld enter "None" or "0."

   (*c*) Total wages paid before any payroll deductions. Payments of "sick pay" and non-cash remuneration are considered wages. If an employer keeps the records described in section 7 of Circular E he may also enter amounts of excludable sick pay in the space adjacent to "Total F.I.C.A. wages paid in 1965." Any amount of sick pay shown in the space should be identified by the words "excludable sick pay."

   (*d*) Total amount of F.I.C.A. employee tax (*not the employer tax*) deducted and withheld, if any (but if there was an adjustment in 1965 to correct the tax for a prior year enter the amount withheld in 1965 increased by the adjustment for an overcollection or decreased by the adjustment for an undercollection). If F.I.C.A. wages were paid but no employee tax was deducted, enter "None" or "0."

   (*e*) Total wages paid (before payroll deductions) subject to the Federal Insurance Contributions Act. Non-cash remuneration is considered wages. If not subject to F.I.C.A., enter "None" or "0." No F.I.C.A. wage entry need be made if (1) F.I.C.A. wages exactly equal the total wages for income tax withholding purposes, or (2) F.I.C.A. wages are $4,800 and the total wages for income tax withholding purposes exceed $4,800.

   (*f*) The employee's social security number, name, and address.

   (*g*) State and local government employers which have been assigned an identification number with the prefix 69 should also show this number.

3. Give copies B and C to the employee (*a*) on or before January 31 following the calendar year if the employee is in your employ at the close of such year, or (*b*) within 30 days after the last payment of wages, if his employment is terminated before the close of such year.

4. Forward copy A to the District Director of Internal Revenue in accordance with the instructions printed on Form 941.

5. For further information see Circular E, Employer's Tax Guide.

U.S. GOVERNMENT PRINTING OFFICE c59—16—78793-1

FORM W-4 (Rev. Jan. 1967)
U.S. Treasury Department
Internal Revenue Service

EMPLOYEE'S WITHHOLDING EXEMPTION CERTIFICATE

Type or print full name ______________________ Social Security Number ______________

Home address ______________ City ______________ State ______________ ZIP code ______________

EMPLOYEE: File this form with your employer. Otherwise, he must withhold U.S. Income tax from your wages without exemption.

EMPLOYER: Keep this certificate with your records. If the employee is believed to have claimed too many exemptions, the District Director should be so advised.

HOW TO CLAIM YOUR WITHHOLDING EXEMPTIONS

1. If SINGLE (or if married and wish withholding as single person), write "1." If you claim no exemptions, write "0" . . . ______
2. If MARRIED, one exemption each is allowable for husband and wife if not claimed on another certificate.
   (a) If you claim both of these exemptions, write "2"; (b) If you claim one of these exemptions, write "1"; (c) If you claim neither of these exemptions, write "0" . . . ______
3. Exemptions for age and blindness (applicable only to you and your wife but not to dependents):
   (a) If you or your wife will be 65 years of age or older at the end of the year, and you claim this exemption, write "1"; if both will be 65 or older, and you claim both of these exemptions, write "2" . . . ______
   (b) If you or your wife are blind, and you claim this exemption, write "1"; if both are blind, and you claim both of these exemptions, write "2" . . . ______
4. If you claim exemptions for one or more dependents, write the number of such exemptions. (Do not claim exemption for a dependent unless you are qualified under Instruction 4 on other side.). . . ______
5. If you claim additional withholding allowances for itemized deductions fill out and attach Schedule A (Form W-4), and enter the number of allowances claimed (if claimed file new Form W-4 each year) . . . ______
6. Add the exemptions and allowances (if any) which you have claimed above and write total . . . ☐
7. Additional withholding per pay period under agreement with employer. (See Instruction 1.) . . . $ ______

I CERTIFY that the number of withholding exemptions claimed on this certificate does not exceed the number to which I am entitled. 048—16—79061-1

(Date) ______________, 19____ (Signed) ______________________

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1. NUMBER OF EXEMPTIONS.—Do not claim more than the correct number of exemptions. However, if you expect to owe more income tax than will be withheld, a smaller number of exemptions may be claimed or you may enter into an agreement with your employer to have additional amounts withheld. Note this if you have more than one employer, or if both husband and wife are employed.

2. ITEMIZED DEDUCTIONS.—See Schedule A (Form W-4) for instructions on claiming additional allowances based on large itemized deductions.

3. CHANGES IN EXEMPTIONS.—You may file a new certificate at any time if the number of your exemptions INCREASES.

You **must** file a new certificate within 10 days if the number of exemptions previously claimed by you DECREASES because:

(a) Your wife (or husband) for whom you have been claiming exemption is divorced or legally separated, or claims her (or his) own exemption on a separate certificate.

(b) The support of a dependent for whom you claimed exemption is taken over by someone else, so that you no longer expect to furnish more than half the support for the year.

(c) You find that a dependent for whom you claimed exemption will receive $600 or more of income of his own during the year (except your child who is a student or who is under 19 years of age).

The death of a wife or a dependent, does not affect your withholding until the next year, but requires the filing of a new certificate. If possible, file a new certificate by December 1 of the year in which the death occurs.

For further information consult your local District Director of Internal Revenue or your employer.

4. DEPENDENTS.—To qualify as your dependent (line 4 on other side), a person (a) must receive more than one-half of his or her support from you for the year, and (b) must have less than $600 gross income during the year (except your child who is a student or who is under 19 years of age), and (c) must not be claimed as an exemption by such person's husband or wife, and (d) must be a citizen or resident of the United States or a resident of Canada, Mexico, the Republic of Panama or the Canal Zone (this does not apply to an alien child legally adopted by and living with a United States citizen abroad), and (e) must (1) have your home as his principal residence and be a member of your household for the entire year, or (2) be related to you as follows:

Your son or daughter (including legally adopted children), grandchild, stepson, stepdaughter, son-in-law, or daughter-in-law;
Your father, mother, grandparent, stepfather, stepmother, father-in-law, or mother-in-law;
Your brother, sister, stepbrother, stepsister, half brother, half sister, brother-in-law, or sister-in-law;
Your uncle, aunt, nephew, or niece (but only if related by blood).

5. PENALTIES.—Penalties are imposed for willfully supplying false information or willful failure to supply information which would reduce the withholding exemptions.

U.S. GOVERNMENT PRINTING OFFICE 048—16—79061-1

CAMPCRAFTERS, Inc.

Social Security No. ____________

Weekly Time Ticket

Note This must be submitted not later than Tuesday following the week for which this report is made.

Employee's Name ____________ Week ending ____________

Day	From	To	Hours	Kind of Work Done	Bldg. (or area)
M					
T					
W					
T					
F					
S					

Total Hours ____________ Rate ____________ Total Amount ____________

Quality of work: (Check)
Satisfactory ____________
Unsatisfactory ____________
Work checked by: ____________

Approved by: ____________
Dept. Chm. ____________
Adm. Asst. ____________

Appropriation
____

Maine's Business

Public Sale Of Valle's Stock Reveals Growth

By Frank Sleeper

When a family-owned corporation goes public (sells shares of its stock to the public), information about it becomes available which wasn't in the public domain before. Thus it is with Valle's Steak Houses which will shortly have 333,000 shares of its stock up for sale.

Donald D. Valle, founder of the firm, and his wife, Sue D. Valle, now own 1,148,585 shares of Valle's common stock or 99 per cent of the stock in the company. After the public sale, the two will own 72 per cent, or 924,585 shares, with the public owning 26 per cent or 333,000 shares, including newly issued shares.

It's interesting to look at the record of Valle's earnings over the past five years. The record is a good one; there's no question about that. For the year ending March 31, 28 cents a share. For the next four 1964, those earnings were $325,814 or years the earnings ran 33 cents a share, 38 cents, 65 cents and 81 cents. Earnings for the year ending March 31, 1968, were $940,366.

Valle's now operates nine steak houses under its name — in Maine, Massachusetts, Connecticut, Rhode Island and New York. It has fast service snack bar restaurants in Kittery and Portland. It also licenses the sale and distribution of salad dressings and condiments under the Valle's trade name.

THE COMPANY was founded in 1933 during the depths of the depression by Don Valle as a sole proprietorship and started with a neighborhood restaurant at Woodfords Corner, Portland. The firm was incorporated under Maine law in 1950, opened in Kittery in 1955, on Brighton Ave., Portland, in 1960 and moved out-of-state for the first time in 1960 at Newton, Mass. It has been expanding ever since.

Its nine large restaurants, have seating capacity for 8,200, stress uniformity of operations. Each is about the same inside and out. Future Valle's Steak Houses all will have seating capacities of about 1,000. The menu is standard for all units. The meals are moderately priced, aiming at a family trade. Most food is prepared in accord with Valle's standard recipes and there's an executive chef who supervises preparation and serving of the food in all the outlets.

Attention to such methods and procedures is intended to bring operating economies and allow patrons to find a uniform quality of foods and services at the Valle's spots. Centralized purchasing arrangements for the restaurants are maintained. This is true for meats, seafoods and supplies and equipment. Perishables are bought by each restaurant manager as required at predetermined prices from local suppliers designated by the company.

Valle's does a lot of advertising. For the year which ended March 31, its advertising costs amounted to about $300,000.

In 1960, Valle's started its own credit card system. For the year ending March 31, sales through use of credit cards were about $1,420,000 with $820,000 on Valle's credit cards and $600,000 on American Express credit cards.

About 15 per cent of the company's sales come from liquor, six per cent from private parties and banquets and the other 79 per cent from food business.

For the year closing March 31, gross income by the steak houses was as follows: Kittery, $1,172,922 or 8.9 per cent; Newton, Mass., $1,828,644 or 13.9 per cent; Portland, $1,637,463 or 12½ per cent; Braintree, Mass., $1,785,785 or 13.6 per cent; Saugus, Mass., $1,298,134 or 9 per cent; Andover, Mass., $1,145,865 or 8.7 per cent; Hartford, Conn., $2,374,837 or 18.1 per cent; and Warwick, R.I., $1,391,217 or 10.6 per cent. The other 3.8 per cent of gross income came from snack bar and miscellaneous sources.

VALLE'S WILL keep expanding. It wants to find locations for from two to four new restaurants a year. Sites for such restsaurants must be between four and six acres. The building for 1,000 costs about $700,000 above the cost of land. Each restaurant requires $325,000 to $350,000 worth of furniture, fixtures and equipment.

It takes about 18 months from the start of negotiations to opening of a new unit. Valle's has entered into purchase agreements for land in Stratford, and West Haven, Conn., for $350,000. It has just opened in Albany and will open next month in Springfield, Mass.

As part of its continued expansion policy, Valle's is negotiating an agreement with a private real estate developer under which it will sell or lease to the developer parts of land it owns for construction of motels or motor hotels under the Valle's name.

The developed won't be required to accept and develop each site offered him by Valle's and may build motels using the Valle's name in locations not close to the restaurants. If, should happen, the developer will sell or lease, if available, enough land there for Valle's to build a restaurant. Valle's will be paid a certain percentage in royalties for use of its name in this connection.

How is money raised by the public sale of Valle's stock going to be used? Of the amount, about $457,000 will retire bank loans made to finance equipment purchases, about $700,000 will be used to buy equipment for the two new locations and about $350,000 will be used to buy the two new Connecticut spots.

Whatever else you can say about Valle's, you have to say that this firm is really growing from its Maine birthplace.

NON-LEGAL
ONE SHARE
$1.00
PAR VALUE

Stock Certificate

NON-TRANSFERABLE
CERTIFICATE NUMBER
No 0125
DATE ____________

This Certifies That

____
first name initial last name number street

____ IS THE OWNER OF
city state or province zip code

ONE SHARE, PAR VALUE ONE DOLLAR, OF THE CAPITAL STOCK OF

CAMPCRAFTERS, INC.

____________________________________ SUBJECT TO INFORMATION ON THIS CERTIFICATE.
city state or province

____
company representative stockholder

STOCKHOLDER VOTES FOR ELECTION OF BOARD OF DIRECTORS

PAY PERIOD ENDING ______________ 19 ______

Campcrafters, Inc.

DATE ____________ 19 ______ SOC. SEC. NO. ________________

NAME

REGULAR EARNINGS		
OVERTIME EARNINGS		
GROSS EARNINGS		
F. I. C. A.		
WITHHOLDING TAX		
TOTAL DEDUCTIONS →		
AMOUNT THIS CHECK		

EMPLOYEE'S STATEMENT OF EARNINGS AND DEDUCTIONS

DETACH BEFORE CASHING CHECK

CAMPCRAFTERS, INC.
GORHAM, MAINE

No.

______________________ 19 ____ $\frac{52\text{-}69}{3214}$

PAY TO THE ORDER OF ____ $ ____________

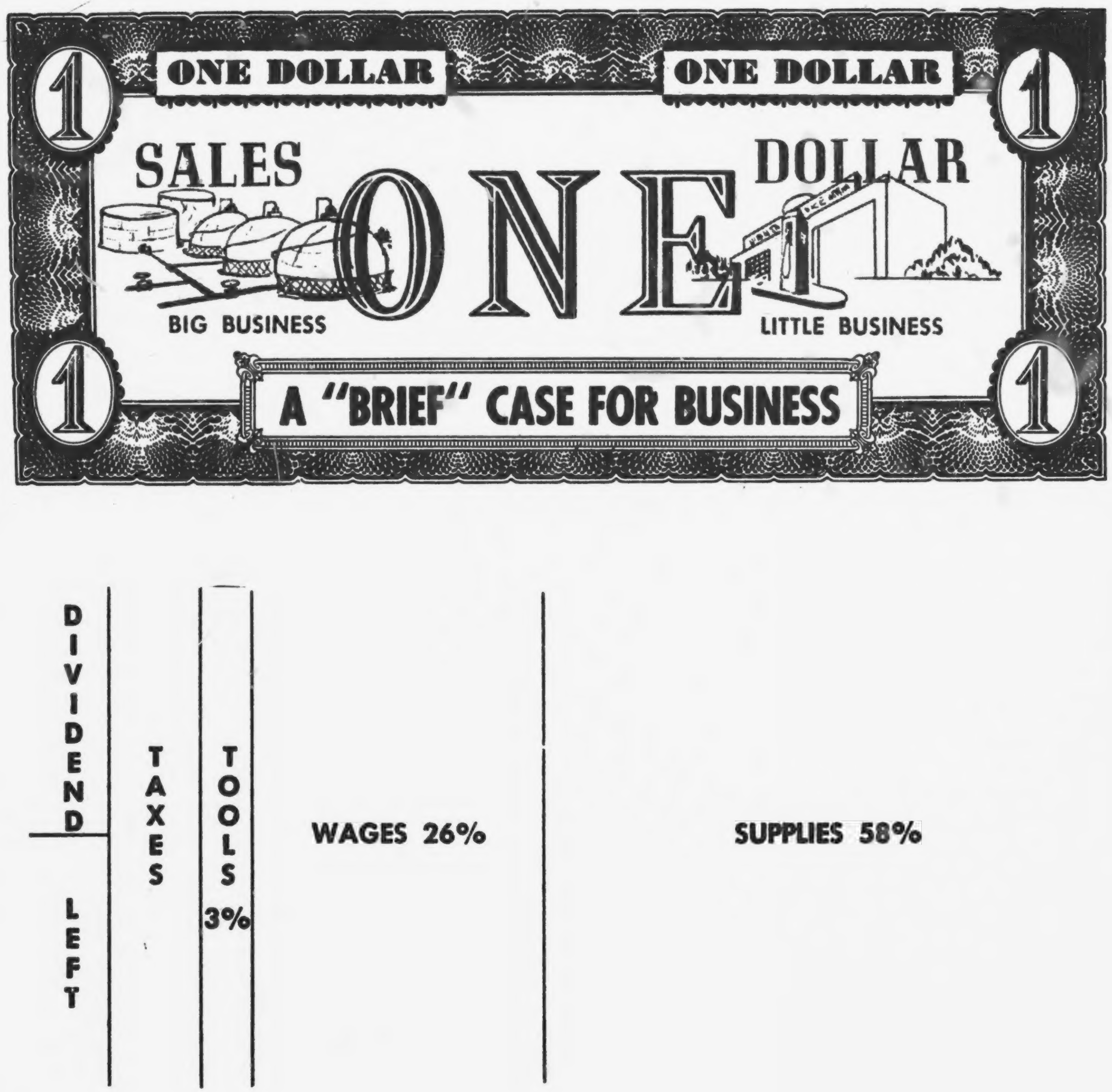
____ DOLLARS

SAMPLE — NOT VALID

THE FIRST NATIONAL BANK

____

⑆3214⑈0069⑆ 987⑈654 3⑈


ONE DOLLAR
ONE DOLLAR
1
SALES
ONE
DOLLAR
BIG BUSINESS
LITTLE BUSINESS
A "BRIEF" CASE FOR BUSINESS
DIVIDEND
LEFT
TAXES
TOOLS 3%
WAGES 26%
SUPPLIES 58%

Title: Functions and Activities of the Personnel Division of a Corporate Manufacturing Industry

Presentation:

I. Employment - hiring

  A. Advertisement (want ads)

  B. Personnel of department

  C. Application for job

    1. Written
    2. Interview

  D. Job placement

  E. Forms used

    1. Record form
    2. Appraisal form

II. Job training

  A. Released time

  B. In plant

  C. Vestibule

III. Employee relations

  A. Social activities

  B. Problem counseling

  C. Safety

IV. Pupil activity

  A. Read want ad

  B. Fill out job application

  C. Be interviewed for a job

  D. Review interview through video tape

  E. Receive training for specific job in the manufacture of a product to be mass-produced

References:

Harold T. Amrine, etal, Manufacturing Organization and Management, Chapter 18

Teaching Aids:

Sample forms with transparencies

1. Want ad section of newspaper
2. Prepared want ad - "Campcrafters, Inc."
3. Application for employment
4. Record form
5. Appraisal form

Closed circuit television

Video tape recorder

MALE

TEST YOURSELF

	Yes	No	?
1. Are you happy in your job?	☐	☐	☐
2. Have you had substantial increases in each of the last two years?	☐	☐	☐
3. Does your job use all your talents?	☐	☐	☐
4. Can you forsee your next promotion?	☐	☐	☐

If your answer to any of these questions is "NO" then we can help you do better in your company or elsewhere. For a free consultation.

CALL CO 6-1105

BERNARD HALDANE ASSOCIATES
EXECUTIVE JOB COUNSELORS
535 Boylston Street, Boston, Mass. 02116

The Harvard Business Review, New York Times, Business Week, the Wall St. Journal, Digests, and 100 other leading publications have reported on the work of Bernard Haldane.

Also in N.Y.C., Philadelphia, Baltimore, Washington, D.C., Los Angeles & San Francisco.

"Prayer helps men to make sound decisions."

KELLY SERVICES HAS OPENED A TECHNICAL DIVIS.

THE KELLY GIRL people are in Harvard Square.

ENGINEERS,
DRFTSMN. & DESGNRS.
COMPUTER & TAB OPS.
PROGRAMMERS
TECHNICAL WRITERS
ACCOUNTANTS

APPLY
KELLY SERVICES
TECHNICAL DIVISION
A Temporary Service
Brattle St., Harvard Sq.
876-6400
An Equal Opportunity Employer

HUDSON BUS LINES MEDFORD, MASS. 70 UNION ST., 395-8080

HAS positions available for bus drivers, full or part-time, mechanics and garagemen — Weymouth, Wakefield, Medford and Lawrence areas.
ALSO positions for Supervisor of Transportation. Experience preferred but not necessary.

MAIL CLERK

DOWNTOWN Boston, can lead to exec. position, $85. Client company pays our fee.
CAPITOL PERSONNEL
8 WINTER ST., BOS., LI 2-5370
649 MASS. AV., CENTRAL SQ.
CAMBRIDGE, UN 4-7280

TRUCK MECHANIC

Fleet garage has immediate opening for a skilled first class mechanic on their third shift. We offer good starting wages, benefits & job security. If interested, call Mr. Maimone at GA 7-3653 for an interview.

HARDWARE STORE MANAGER $126 AND UP

Experienced man or will train the right man for job. 277-4369.

GENERAL FACTORY WORKERS

All 3 Shifts

No experience necessary, liberal company benefits. We have never had a layoff.

SWEETHEART CUP CORP.
33 Potter St.
UN 8-7400
(Nr. Kendall Sq.)
Cambridge
An Equal Opportunity Employer

ELECTRONICS MANAGER

SUPERVISE small group in electronics co. ideal for someone going to night school for business management, also knowledge of solid state elec. helpful, to $10,000, company pays our fee.
CAPITOL PERSONNEL
8 WINTER ST., BOS, LI 2-5370
649 MASS. AV., CENTRAL SQ.
CAMBRIDGE, UN 4-7230.

MELROSE

STONEHAM area, guards, 4 p.m.-12, 12 to 8 a.m., 5 days, M.-F.; also shifts week-ends, $1.85 an hour; Cambridge, 4:30-11 p.m., 5 days, nice spot for older man, $1.60. WHITE'S EMP., 18 Tremont.

WAREHOUSEMAN

WITH license to drive a car, good steady position, 5-day week. A good future for the right man. Profit sharing plan. References required. Apply STAR SALES, 1102 Washington st., Boston.

SUPERINTENDENT

woodworking factory Eastern Canada. To operate rough mill. Knowledge of lumber drying. Supervise yard crew. Give age, experience and salary desired to N 8, Boston Globe.

CLERICAL

Typist-Addressograph operator-Calculating Machine operator. North Staion area. Start $108. Excellent fringes. An equal opportunity employer. Call 227-6000, ext. 612.

MALE

AUTO RATER COMMERCIAL EXPERIENCED

Top salary available. Open also to male applicants. Promotional opportunities. Generous benefits including our outstanding health plan. Modern air-conditioned office building, attractive company cafeteria. Convenient downtown location.

Apply in person or
write or phone Miss Roth

THE CONTINENTAL
INSURANCE COMPANIES
87 KILBY St., Boston
TEL. 482-8500

LUMBER YARD

SUPERINTENDENT

NEW branch of new England's largest cash-and-carry lumber yard, to be located next to Avco plant in Wilmington, Mass. (5 min. off Rte. 128) opening in the Fall wants a man experienced in all phases of framing lumber, millwork and materials handling. Five-figure salary plus all fringes No night work, 5-day week. BREWSTER BUILDING MATERIALS CO., Providence, R.I.

PAINT FACTORY

Wants accurate, reliable man to become Mill Oper., no experience necessary, excellent starting pay, excellent benefits, permanent job. Interviews 11-2 daily, or call Charles Aronson, at 524-2038 for app't. BEACON PAINT WORKS, 76 Stonely Rd., off Brookley Rd., behind MBTA car barn, Forest Hills.

STORE MANAGER

FOR South Shore dairy store chain. The man we are looking for mst have some retail experience in the grocery business and or personal qualifications of aggressiveness, ability to meet people, and the desire to grow with the company. This is a salry plus commission job. Two weeks vacation, fringe benefits. Call 769-3615 from 10 a.m. to 3 p.m., Monday through Friday.

STORE CLERK

GOOD opportunity for older man. 5½-day week. Apply in person, 9:30 a.m.-4 p.m. to Mr. William Foster or call 445-2800.

PILGRIM LAUNDRY
65 Allerton st., Roxbury
(Off Mass. Ave.)

UNDERWRITERS ADJUSTERS

IMMEDIATE openings downtown for trainees and exper. applicants, prefer college grad., $6600 and up. Fee paid.
EXP. ADJ.—No. Shore
EXP. ADJ.—Newton Area
A. D. ASSOCIATES PERSONNEL
8 WINTER ST., HA 6-7536

DEDICATED TEACHERS FOR ADULTS

Part time teaching of reading and math improvement. 2 yrs. college desirable but not nec. Serve your community and earn $2 per hour minimum. Send resume to MANPOWER TEACHING SERVICES, 19 Temple pl., Boston.

FOREMAN FINISHER

FULL charge of mod. finishing dept., union scale, paid vac., holidays & ben., exc. oppty for advanc., loc. on bus line. ROBERT SCOTT INC., 18 Moreland st., West Roxbury, Mass. 323-0700.

Meat Cutter

Apply in person, New England Hotel Supply Co., 60 Fulton st., Boston.

SALESMAN

Educational books, magazines or some exp. in field selling. Budget program with premium. 46 cents per wk. unit, excl. value for consumer. Unbelievable commission. $20 per order. For interview 10 a.m. to 12 noon. Mr. Young, Suite 300, 376 Boylston st., Boston.

EXP. SHOE SALESMEN

Top job for responsible men.

MALE

PERSONNEL TRAINEE UP TO $8000-$11,000 FIRST YEAR PLUS PROFIT SHARING

WORK for Boston's most successful & progressive professional employment agency! Hire, screen, interview & test applicants in our Prudential offices for the finest companies in N.E. We will train you to become expert in this field & offer you the opportunity to use your imagination & drive. As your skill increases, so do your earnings. Comprehensive medical ins., as well as liberal vacation & bonus plans. To arrange a day or evening interview call Bruce Montville at 262-5600.

SCIENTIFIC PROGRAMMER

With 1 or 2 years solid math experience who now wants broad exposure. Join our small consulting firm. Send note to

MMI
Box 62, Cambridge, Mass. 02140
or call: MR. MONAHAN
617-492-7010

CREATIVE EDITOR

Challenging position for a talented editor with knowledge of public school education. Will assume editorial responsibility for publications addressed to School Administrators. Top writing skills essential. A key spot with a small lively company. Send resume with salary requirements to J. Johnston, CROFT EDUCATIONAL SERVICES, 100 Garfield av., New London, Conn. 06320. An Equal Opportunity Employer.

SALES ENGINEER

NATIONAL manufacturer of road machinery, crushing and conveying equipment, has an opening in New England for man with sales and engineering background. Send resume of experience to:

BARBER-GREENE CO.
P. O. Box 98, Needham Heights
Massachusetts 02194

LICENSED PLUMBERS $6.27 AN HOUR CALL 825-5560 ASK FOR TONY

PRINTING CIRCUIT SUPERVISOR

SUPERVISORY Exp. & knowledge of printed circuit fabrication nec, $8-9K, client company pays our fee.
CAPITOL PERSONNEL
8 WINTER ST., BOS., LI 2-5370
649 MASS. AV., CENTRAL SQ.
CAMBRIDGE, UN 4-7280

TRAINEES

NATION wide consulting and investigating firm offers bright single men a chance to train in trouble shooting while being paid an excellent salary and expenses. Recent college or work experience helpful. Travel opportunity. Apply Boston Office, 38 Chauncy st. Room 315.

HANDYMAN PLUMBER'S HELPER TWO POSITIONS AVAIL.

Large real estate firm. 782-7227; 782-7231.

PUBLIC ACCOUNTANT

For growing CPA office in Boston. At least 2 yrs. or more recent PA exper. No overnight travel. Present staff knows of this ad. Please write exper. & salary requirements to A 229, Globe.

ANIMAL HANDLER

TO work in animal shelter, Mass. drivers license necessary. Minimum age 21. Permanent position. Apply 9 a.m.-5 p.m. Animal Rescue League, cor. Tremont & Arlington sts., Boston.

USED CAR MANAGER

Capable of running a volume operation, directing men and promoting sales. Bonus pay plan; all fringe benefits. Apply in person to Mr. Lyons, KONNER CHEV-

MALE

FORD MOTOR CREDIT CO.

Currently has opening for an adjuster. This position offers exc. opportunities for advancement in the area of

OUTSIDE COLLECTIONS

The adjuster conducts wholesale audits, makes retail commodity checks, and adjusts delinquent accounts. Applicants for this position should have some college background. At Ford Motor Credit Co., you will work in a progressive atmosphere and enjoy stability, good pay, and exc. benefits. Contact Mr. P. B. Sherry at Ford Motor Credit Co., 599 North Ave., Wakefield, Mass. Lakeside Office Park. 245-3600.
An equal opportunity employer.

MANAGEMENT TRNEE.

A CENTURY OLD company due to expansion operation in the greater metropolitan area requires two college graduates or business equivalent for an extensive three-year training program in the financial field, salary open to $15,000 within three years. Write P. O. Box 1584, Boston, Mass. 02104, education, interests and background. All replies confidential. Equal opportunity employer.

BANK'G CAR. OPPTY.

THREE positions available in rapidly growing Boston bank. bookkeeping department supervisor, bank bookkeeper, experienced commercial teller. Excellent fringe benefits. Write CITY BANK & TRUST COMPANY, 173 Washington st., Boston 02108, Attn: Mr. Epstein.

BOY'S CAREER TRAVEL

An equal opportunity employer. Int. concern has openings for single, neat, ambitious boys 18-24 in Circ. Sales, Travel, Wash. D.C., Miami, New Orleans, Chicago and return above average comm. plus $500 bonus, expenses paid, transp. furn., leave immed. Call Mr. D'Arcus, 262-1009, 10-4 p.m. TUESDAY ONLY.

R&D NEEDS HELP

IF you can expedite, if you can work effectively under pressure, are endowed with the strength of your convictions, understand basic mechanisms, have some knowledge of machine shop practice & drafting, and a really strong desire to function accurately and intelligently in a creative capacity . . . we may have something interesting for you. Call Fensterwald at 828-4100.

Janitor-Maintenance

Full responsibility for janitorial duties and minor maintenance of commissary, general offices, and restaurant, nights. Moving to new building in Burlington. Experience desired.

PEWTER POT MGMT. CORP.
33 Dartmouth St., Malden Sq.
For interview call 321-1311

MEAT CUTTING APPRENTICES

Applications now being accepted. Learn a trade. Earn over $3.00 per hour and all fringe benefits.

Pearl Brand Training Dept.
196 Quincy St.
Roxbury
445-6020

TEMPORARY MECH. DRAFTSMAN

3 mos. assignment.
Apply:
Technical Div. of Kelly Services
4 Brattle st., Harvard sq.
876-6400
An Equal Opportunity Employer

Young Men Travel

Need three to fill circ. sales group travel, U.S.A. Immediate cash draw on the job training, sal. comm. $500 yearly bonus, must be willing to leave immediately. See Mr. Huscher Bradford Hotel. 426-1536, 10:30 a.m. to 6 p.m.

ACCOUNTANT

MAJOR dairy has management position available. Excellent opportunity for person seeking responsibility with supervisory experience. Send resume and salary history to D 115, Globe office.

SHOE SALESMAN

Excellent opportunity for ambitious man to grow in the retail children's shoe field. Experience necessary. JAMES DAVID

HELP WANTED - MALE AND FEMALE

Campcrafters, Incorporated has located its new plant in the Gorham, Maine area. We have immediate openings for:

1 Quality Control Engineer

4 Line Foremen

10 General Production Employees

Union Shop, short hours, excellent fringe benefits. No experience necessary - - - we will train. If interested, see Mr. Knowles in Room 200A, Industry and Technology Center, Gorham State College, Gorham, Maine at 11 a.m. weekdays.

An Equal Opportunity Employer

APPLICATION FOR EMPLOYMENT

Print your name in full:

Last First Middle

Street address Nearest telephone

City State Soc. Sec. No.

How long at this address? Wages expected?

Age Date of birth Height Ft.,In. Weight Lbs.

Circle One

Married Single Widowed Divorced Sex: M F

Number of children List other dependents

Have you any physical defencts? If so, what?

Hobbies:

How many days have you lost by illness in the past two years?

Why are you seeking employment?

Were you ever employed by this company?

Names of friends or relatives working here

List names of employers you have had in the past five years and how long employed by each:

EDUCATION

	Name of School	Location	Yrs. attended	Yrs. completed
Grammar School			19 to 19	
High School			19 to 19	
Other education or Special Training			19 to 19	

I declare and warrant that the answers made herein are correct and true and that I am willing to undergo examination and to be fingerprinted.

Date Signed

CAMPCRAFTERS, Inc.
Gorham, Maine

RECORD OF EMPLOYMENT

Campcrafters, Inc.
Gorham, Maine

Are you now employed?_____ If not, now long have you been unemployed?______

Beginning with your last or present job, record below the complete details of your experience:

From	To	Employer	Address	Wage	Duties	Reason for leaving

MACHINE EXPERIENCE

Please check the two machines below with which you have the most experience:

Table Saw_____ Drill Press_____ Band Saw_____ Jointer_____ Shear___

Spot Welder____ Surfacer____ Jig Saw____ Belt Sander____ Wood Lathe____

Machine Lathe_____ Bench Grinder_____ Box and Pan Brake_____

What is the best job you ever had?______________________________

Employer______________________________ Address_________________________

Have you been in the Armed Forces? Yes___ No___

If so, give date: From __________ 19__ to ____________19__ Rate or rank____

Type of discharge_________________________________

Applicant will not use this space

Remarks____

Date____________________ Signed______________________________

Accepted___ Job_________________________________

Rejected___

CAMPCRAFTERS, INC.
Gorham, Maine

APPLICANT APPRAISAL FORM

To:

Applicant:

An application has been received from the individual whose name is given. We should appreciate your evaluation of this person's characteristics, ability and potential by completing this form. In particular, we should appreciate any comments you can provide at the bottom of this form, as such information is especially valuable. Your evaluation and comments will be held confidential.

It is important that the completed form be returned promptly so we may proceed with our consideration. A self-addressed envelope is enclosed for this purpose. Your cooperation will be most helpful and very much appreciated.

Please use as a basis for rating the comparison of this individual with all of the students with whom you have come in contact in your teaching (or working) career.

Yours very truly,

Director of Personnel

****

	No basis for rating	Poor	Fair	Average	Good	Superior
1. GENERAL APPEARANCE Neatness, grooming, posture, dress, physical appearance	☐	☐	☐	☐	☐	☐
2. SOCIAL IMPRESSION Social ease, speech and expression, mannerisms	☐	☐	☐	☐	☐	☐
3. ABILITY TO GET ALONG WITH OTHERS Patience, open-mindedness, adaptability, respect for others	☐	☐	☐	☐	☐	☐
4. COMPETENCY Ability to learn easily, ability to apply knowledge and ideas readily, creativeness, ability to analyze and plan, accuracy, reliability	☐	☐	☐	☐	☐	☐
5. LEADERSHIP	☐	☐	☐	☐	☐	☐

COMMENTS:

Title: Functions and Activities of the Engineering Division of a Corporate Manufacturing Industry

Presentation:

I. Product design (scientific method)

  A. Statement of problem

  B. Analysis and research

  C. Possible solutions

  D. Experimentation

  E. Final solution

II. Quality control

  A. Inspection

    1. Need for inspection
    2. Types of inspection
    3. Tools of metrology

  B. Failure

    1. Scrap
    2. Rework

  C. Prevention of poor quality

    1. Design prototypes
    2. Lab testing of prototypes
    3. Field testing

III. Tooling methods

  A. Hand

  B. Machine

  C. Automation

IV. Plant maintenance

  A. Types of responsibilities

  B. Types of maintenance

    1. Machines and equipment
    2. Housekeeping

V. Work schedule

A. Need for schedules

B. Types of schedules

1. Long range
2. Short range

VI. Student activities

A. Select a new product to be produced

B. Develop prototype for new product

C. Develop a work schedule to make product

References:

Amrine, Ritchey, Hulley, *Manufacturing Organization and Management*, Prentice-Hall, Chapter 18.

Anderson, A. D., *Designer's Notebook*

Lindbeck, John, *Design Textbook*, Chapter 1

Teaching Aids:

Film, *The Factory, How a Product is Made*

Title: Basic Elements of Engineering Drawing

Note to instructor using this lesson:
The items in this lesson plan are not intended to be taught to any degree of depth. They are only listed here to give an idea as to the items that would be included in an overview of engineering drawing. The emphasis in this lesson should be placed on items I and IV.

Presentation:

I. Drawing is an international language

  A. Accurate way of explaining an object

  B. Has alphabet

    1. Object line
    2. Hidden line
    3. Center line
    4. Dimension line
    5. Extension line
    6. Break line

  C. Combination of symbols develop a clear expression of an idea

II. Drawings have many forms

  A. Pictorial

    1. Isometric
    2. Oblique
      a. Cabinet
      b. Cavalier
    3. Perspective
      a. One point
      b. Two point

  B. Orthographic projection
    1. One view
    2. Two view
    3. Three view
    4. Auxiliary view

  C. Stretch out

  D. Sketches

    1. Free hand
      a. Pictorial
      b. Orthographic

III. Instruments of drawing

- A. Drawing board or table

- B. T-square

- C. Triangles

  1. 30-60 degree
  2. 45 degree

- D. Scales

  1. Architects
  2. Mechanical engineers

- E. Pencils

  1. Hardness - 9H, 6B
  2. Types
     - a. Wood
     - b. Mechanical

- F. Erasers

  1. Pearl or ruby
  2. Art gum
  3. Erasing shield

- G. Drawing set

  1. Bow compass
  2. Leg compass
  3. Dividers
  4. Inking pens
     - a. For circles
     - b. For straight lines

- H. Miscellaneous tools

  1. Protractor
  2. Brush
  3. Pencil pointer
  4. French curves
  5. Lettering tools
  6. Tape

IV. Student Activities

- A. Study working drawings

B. Make sketches of a simple project to be produced

   1. Detail of pieces
   2. Assembly of product

C. Make sketches of necessary jigs and fixtures to manufacture a product

References:

Groneman, C. H. and J. L. Feirer, General Shop, pp. 2-64

Olson, Delmar, Industrial Arts for the General Shop, pp. 11-47

Teaching Aids:

Closed circuit television

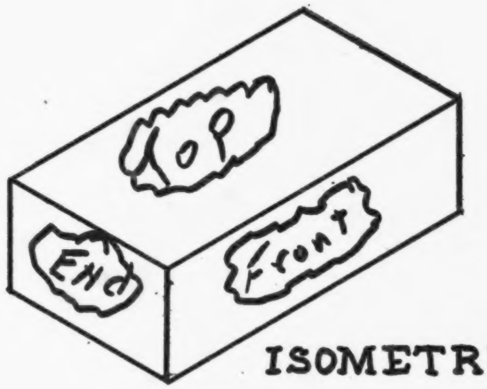
Transparencies of drawings for product

Information sheet: "How to Describe a Box with Engineering Drawing"
"Notes on Engineering Drawing"

Drawing: A drawing developed and printed during lecture by team member using closed circuit TV

How To Describe A Box ~

Using ~ Engineering Drawing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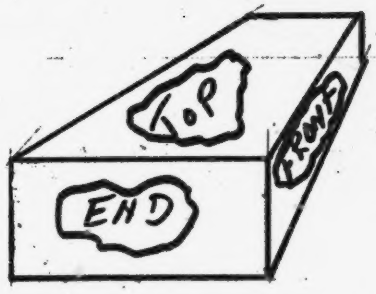
ISOMETRIC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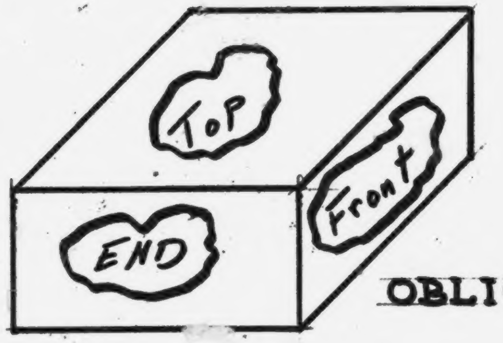
PERSPECTIVE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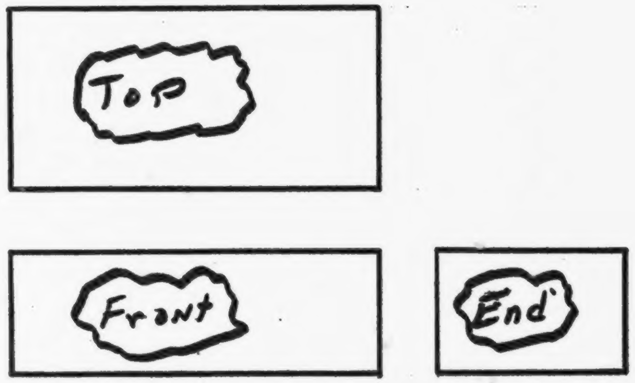
OBLIQUE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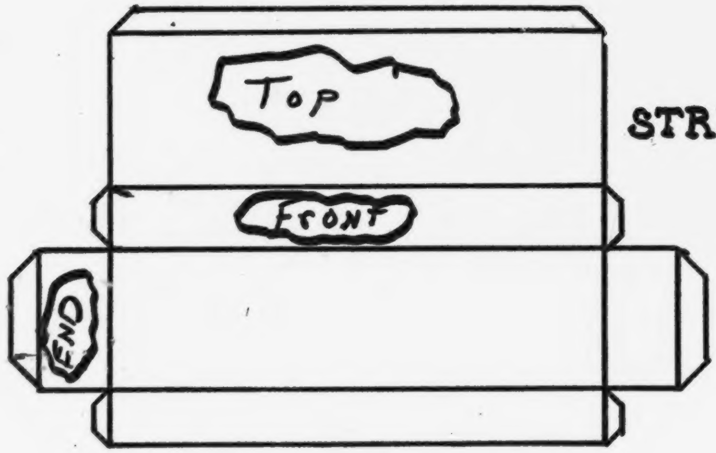
ORTHOGRAPHIC PROJECTION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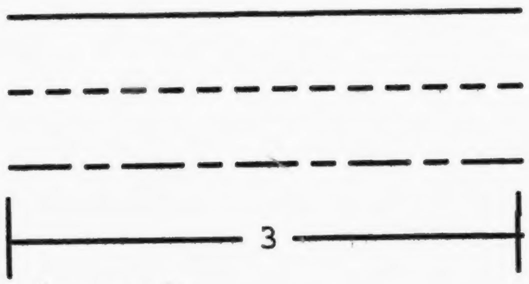
END

STRETCH-OUT

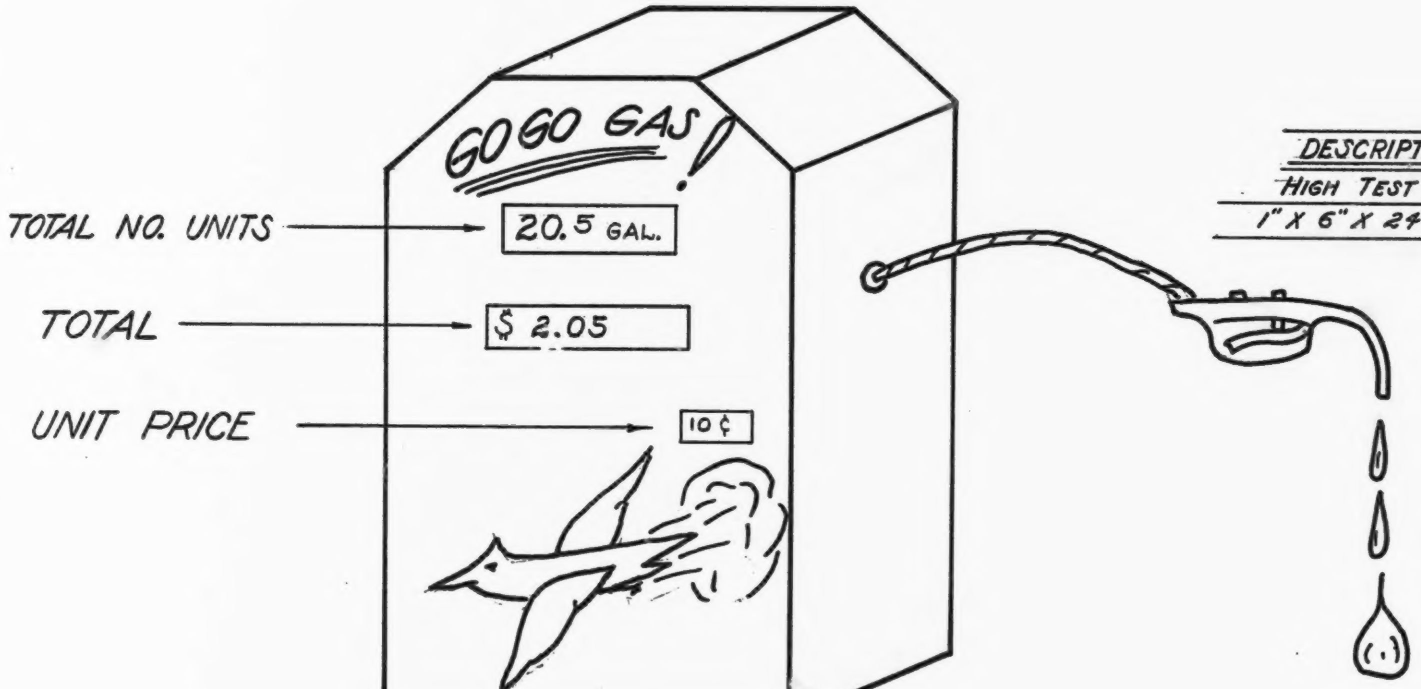
SOME POINTS TO REMEMBER ABOUT ENGINEERING DRAWING AND SKETCHING

1. It is much easier to explain a product through a picture, sketch, or drawing.
2. Drawing is an international language that may be understood by anyone who knows the alphabet of lines and how to use it.
3. Accuracy in measurement is important to show the people who are to make the part exactly what is necessary to make the part.
4. The proper form of drawing should be selected to best show the product.
5. The basic alphabet of lines:
    a. Object or visible line
    b. Hidden line
    c. Center line
    d. Dimension and extension line



6. Drawing is necessary for all manufacturing work.
7. People who make drawings:
    a. Engineers
    b. Designers
    c. Architects
    d. Draftsmen
8. Sketching is freehand engineering drawing.
9. Neatness is very important when a drawing is made.
10. People who make drawings must take very good care of the tools that they use.
11. Blueprints are made from good drawings or tracings.

No Smoking
IT COULD BE HAZARDOUS TO
OUR HEALTH


GO GO GAS!
TOTAL NO. UNITS
20.5 GAL.
TOTAL
$ 2.05
UNIT PRICE
10¢

DESCRIPTION	MAT.	TOTAL UNITS	UNIT PRICE	TOTAL
HIGH TEST		20.5 GAL.	.10 GAL.	$2.05
1" X 6" X 24"	MAPLE	1 B.F.	.60 B.F.	.60

GROUP "3" G.S.C.

R. I. Dean
Kenneth E. Olson

Janice Leavitt
Penny Briggs
Kristene Carpenter
Pamela Kirkpatrick
Linda Arthur

Nancy Fisk
Alan McLucas
Matthew Sheehan
Joseph K. Ramsdell
Andrew Bent
Mark Beede

CAMPCRAFTERS INC. GORHAM, ME.		
	SCALE FULL	DRAWN BY SNOOPY REVISED NEVER
DATE 7-25-68	APPROVED BY BIG WHITE BIRD	DRAWING NUMBER "007"

Title: Functions and Activities of the Production Division of a Corporate Manufacturing Industry

Presentation:

I. Purchasing

  A. Bill of material

    1. How used
    2. Why used
    3. Forms used

  B. Sources of material

  C. Units of purchasing; e.g., board foot, lineal foot, square foot, lbs., etc.

  D. Types of material

    1. Raw
    2. Finished
    3. Sub-assembly

  E. Incoming material inspection

II. Production planning

  A. Need for

  B. Types of

    1. Long range
    2. Short range

  C. Personnel

  D. Forms used

III. Production

  A. Parts manufacturing

  B. Sub-assembly

  C. Final assembly

  D. Finishing

  E. Quality control and inspection

    1. Rework
    2. Reject

F. Testing

  1. In laboratory
  2. In field

G. Packaging

  1. Types of packages
  2. Tools of packaging

IV. Student activity

A. Develop bill of material

B. Figure cost of a product

C. Manufacture and package a product

References:

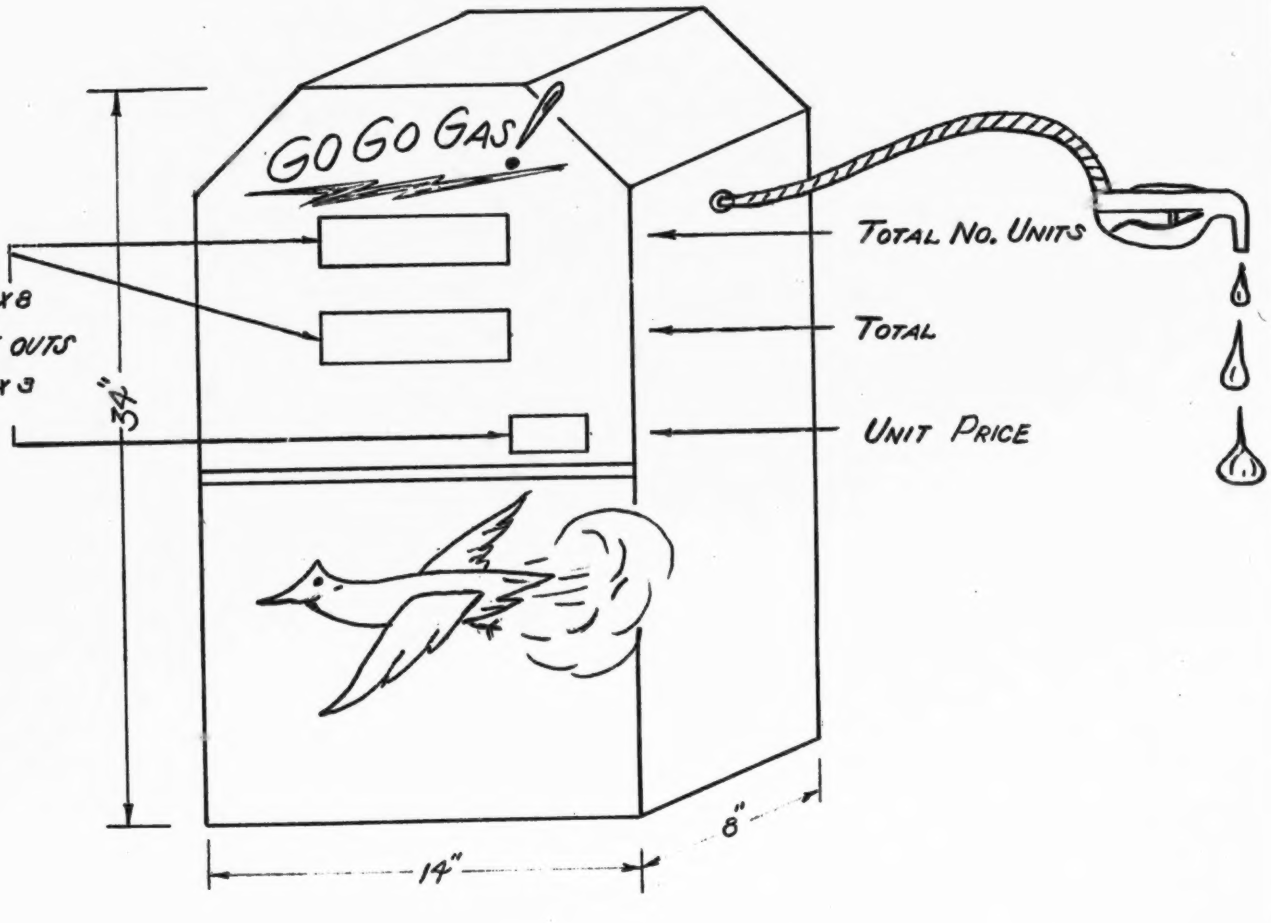
Haws and Schaefer, Manufacturing in the School shop, pp. 19-35

Delmar W. Olson, Industrial Arts and Technology, pp. 100-149

Teaching Aids:

1. "Gas Pump," blackboard tool
2. Form for bill of material

BLACKBOARD VISUAL AID


GO GO GAS!
TOTAL NO. UNITS
TOTAL
UNIT PRICE
$2\frac{1}{2}$ X 8
CUT OUTS
$1\frac{1}{2}$ X 3
34"
14"
8"

THIS AID WAS DESIGNED TO RELATE GASOLINE PURCHASING TO A STUDENT'S "BILL OF MATERIALS".

MADE FROM 1/4" PLYWOOD, IT CONTAINS THREE CUT-OUT HOLES TO ENABLE WRITING THROUGH ONTO THE BLACKBOARD.

IT WAS PAINTED IN ATTRACTIVE COLORS TO GIVE THIRD DIMENSION APPEARANCE. A HOSE AND SPOUT CAN BE DRAWN ON THE BLACKBOARD WITH CHALK.

COST ANALYSIS OF A PRODUCT

STOCK BILL

PART	NO. PCS.	DESCRIPTION	MTLS.	NO. UNITS	UNIT COST	TOTAL
TANG	1	1/8" X 1/2" X 10"	BAND IR.	10"	.12/LIN. FT.	
BLADE	1	3" X 6" -20 GA.	STAIN. STL.	1/8 S.F. .125	1.10 SQ. FT.	.14
HANDLE	1	1" X 1 1/8" X 6"	BLACK WALNUT	1/6 B.F.	1.00 B.F.	.06
HARDWARE	2	1/8 X 1/4 POP RIVETS	ALU.	2	.02	.04
	3	1/8 X 1" ROUND HD. RIVETS	ALU.	3	.01	.03
FINISHING		ABRASIVES & OTHER MTL'S.				.08
WELDING						
ELECTRICAL						

TOTAL MATERIALS .45

LABOR, TAXES, LIGHTS & POWER, TRANS., RE-WORK, etc.
PACKAGING, SALESMEN, ADVERTIZING (OVERHEAD) 50% .225

FACTORY WHOLESALE PRICE .675

MIDDLEMAN OR RETAIL MARKUP 40% .27

PRODUCT TURNOVER AFFECTS MARKUP
AS WELL AS VOLUME & SINGLE UNIT SALES

SUGGESTED CONSUMER
PURCHASING PRICE 95¢

FOREIGN IMPORTS &
LOCAL COMPETITION CAN AFFECT RETAIL PRICE

Title: Development, Organization and Function of Unions

Presentation:

I. Early development of unions

  A. Need for union

  B. Organization of early unions

  C. Operation of early unions

II. Organization of modern unions

  A. Leadership

  B. Rank and file

III. Functions of modern unions

  A. Wages

  B. Working conditions

  C. Legislation

  D. Education

IV. Strikes and other types of work stoppage

  A. Reason for strike

    1. Wages
    2. Conditions of work
    3. Discipline

  B. Types of work stoppage

    1. Called strike
    2. Wild-cat strike
    3. Sit-down strike
    4. Lock-out
    5. Boycott
    6. Work slowdown

V. Operation of a union

  A. Adopt constitution

  B. Elect officers

  C. Hold meetings

  D. Establish an office

    E. Keep records

    F. Negotiate contract

VI. Terminology of unions

VII. Pupil activity

    A. Organize a union

    B. Negotiate union contract

References:

Building Service Employees' International Union, Your Union

AFL-CIO, The Vital Link, 1964.

Commissioner of Labor and Industry, Labor Laws of Maine, Augusta, Maine, 1965

Amrine, Ritchey, Hulley, Manufacturing Organization and Management, Chapter 19

Teaching Aids:

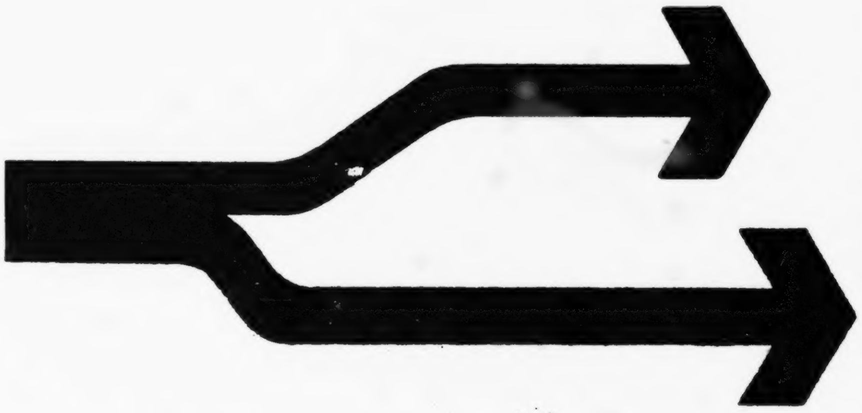
Teaching team form picket line using strike placards:

1. "Campcrafters, Inc., Unfair to organized labor"
2. "Campcrafters, Inc., Refuses to recognize union"
3. "Campcrafters, Inc., Employs scab labor"
4. "International Camp Equipment Workers - AFL-CIO"
5. "On Strike, ICEW AFL-CIO"

Pass-out sheets with overhead transparencies:

Organizations of unions (3)
Language of unionism

The Language of Unionism



AFL-CIO
The American Federation of Labor and Congress of Industrial Organizations. The national organization that speaks for the labor movement in the United States.

AGREEMENT
A binding contract entered into by union and employer for a specified period of time. It defines the relations between them, spells out the terms and conditions of employment, and describes the procedures to be used in settling disputes during the term of the agreement.

AFFILIATION
The membership of a local union in some kind of grouping of local unions, such as an international union or a state federation.

ARBITRATION
The process of permitting an impartial judge or arbitrator to settle a dispute between union and employer.

AUTOMATION
A loosely used term generally intended to refer to the replacement of the human worker by machinery—as the elimination of the elevator operator by the automatic elevator.

BOYCOTT
The refusal of a group of people, such as a union or a consumer's organization, to purchase the products of a particular company.

BUSINESS AGENT
An employee of a local union who organizes the unorganized and helps negotiate agreements and settle grievances.

CERTIFICATION
An official order of a labor relations board designating a local union as the collective bargaining agent for a specific group of employees.

CHARTER
An official document through which an international union establishes a local union and gives to it rights and duties under the international union's constitution.

CHECKOFF
The system under which the employee directs the employer to deduct union dues from his wages and turn them over to the union.

CITY CENTRAL
An organization of AFL-CIO local unions within the city or county. Also called "federated trades council," "central trades and labor council," or "central labor union."

CLC
The Canadian Labour Congress. The national organization that speaks for the labor movement in Canada.

COLLECTIVE BARGAINING
Negotiations between union and employer in order to determine terms and conditions of employment.

COMPANY UNION
An organization—not properly a union—of the employees of a given employer, who generally "runs" the company union from behind the scenes. Such a group is generally unaffiliated with other unions.

CONCILIATION
The effort to settle a dispute between union and employer through the services of a disinterested person. Unlike an arbitrator, a conciliator (or mediator) does not make a decision in the dispute but merely tries to bring the parties to agreement. Used synonymously with "mediation."

CONTRACT See "Agreement."

COPE
The Committee on Political Education of the AFL-CIO established to educate about political issues, support the best candidates for public office, and encourage voting.

DUES
Regular monthly contributions which members pay to cover costs of operating their union.

ESCALATOR CLAUSE
A provision in a union contract which ties the wage rate, or a part of it, to changes in a "cost-of-living" measure, such as the Consumer Price Index.

FEDERAL LABOR UNION
A local union affiliated directly with the AFL-CIO, not through an international union.

FREE LOADER
A worker who benefits from unionism but refuses to pay his share of the cost (that is, his dues).

"FRINGE" BENEFITS
Non-wage benefits, such as paid vacations and health insurance, won from employers through collective bargaining.

GRIEVANCE
Employee dissatisfaction with some aspect of his job. "Grievance Procedure" in the contract describes how union and management attempt to alleviate such dissatisfaction.

ICFTU
The International Confederation of Free Trade Unions.

INDEPENDENT UNION
A weak union not affiliated with a federated organization like the AFL-CIO. So-called "independent" unions often are, or become, company dominated.

JURISDICTION
The occupations, industries, and area in which a union, through its charter, has been assigned to organize.

JOINT COUNCIL
A cooperative grouping of unions, for example Building Service unions, within a specified geographical area.

LABOR RELATIONS BOARD
The state or federal agency which certifies unions, rules on unfair labor practices, and defines appropriate bargaining units when called upon to do so.

LANDRUM-GRIFFIN
This 1959 revision of the federal labor relations law continues, and makes even more severe, most of the objectionable provisions of the Taft-Hartley Act. It substantially increases the reporting and record-keeping burden on unions and is discriminatory and unfair to the trade union movement.

LOCAL UNION
An organization of wage-earners, usually in specified occupations and industries and within a specified locality, designed to unite the economic power of its members for the purpose of bargaining collectively with the employer or his spokesman.

LOCKOUT
A withholding or shutting down of work by an employer in order to force employees to accept his terms.

MAINTENANCE OF MEMBERSHIP
A kind of union security provision which requires those employees who are members of the union to remain members for the duration of the contract.

MEDIATION
See "Conciliation."

MINIMUM WAGE LAW
Legislation which provides that workers must not be paid less than a certain wage. Both the states and the federal government have minimum wage laws, but many workers are not covered.

NATIONAL LABOR RELATIONS BOARD
See "Labor Relations Board."

OPEN SHOP
A place of employment where workers are employed regardless of whether or not they are union members. (So-called "open shops," however, are generally "closed" to union members.)

PER CAPITA TAX
The regular monthly affiliation fee paid to a "parent" organization by a union for each of its members.

PICKETING
The act of walking back and forth (by members of a local union) before the place of work with which the union is in dispute and informing the public that a dispute exists.

"RIGHT-TO-WORK" LAW
A misnamed type of state law which guarantees no one the right to work, but only keeps unions from negotiating union shop contracts. Such laws are aimed at destroying unions by attempting to cut down their funds.

SCAB
An employee who continues to work during a strike. Also, a person who accepts work in a building or other place of employment where a strike exists.

SENIORITY
An employee's standing on a list based on length of service on the same job or with the same employer.

SEVERANCE PAY
An addition to regular wages, which is paid to an employee whose employment is terminated through no fault of his own.

SHOP CARD
A prominently-displayed sign by which employers indicate to the public that their employees are covered by an agreement with a BSEIU local union.

STATE FEDERATION
The state-wide association of AFL-CIO local unions, organized chiefly for purposes of presenting a solid front before the state legislature.

STEWARD
Also called shop steward. An employee elected or appointed by the union to assist union members in getting their grievances remedied.

STRIKE
A withholding of labor in order to protest a grievance or to enforce a demand for better wages and working conditions.

TAFT-HARTLEY
The 1947 revision of the federal labor relations law, still in effect today. While dressed up to resemble its predecessor (the Wagner Act), Taft-Hartley is aimed at hampering and destroying unions. Strong unions, high industry profits, and labor shortages have kept employers from making the fullest use of this vicious anti-labor weapon.

UNION LABEL
A small label attached to manufactured articles in order to inform prospective buyers that the article was produced by union workers.

UNION SECURITY PROVISION
Clause in an agreement which defines the rights of the union as an organization. Examples are union shop, closed shop, and maintenance-of-membership provisions.

UNION SHOP
An agreement between union and employer which requires all employees to remain members of the union, and those hired to become members.

WELFARE PROVISION
A clause in a union-employer agreement in which the employer agrees to provide pensions, life or hospital insurance, or some other kind of assistance to employees during periods of sickness or retirement.

WILDCAT STRIKE
A strike called by union members or other workers without the sanction of the union.

WITHDRAWAL CARD
The card given to a member who voluntarily leaves the union. It shows that he or she was in good standing while a member.

BSEIU

BUILDING SERVICE EMPLOYEES' INTERNATIONAL UNION (AFL-CIO)

900—17th Street, N.W. Washington 6, D.C.

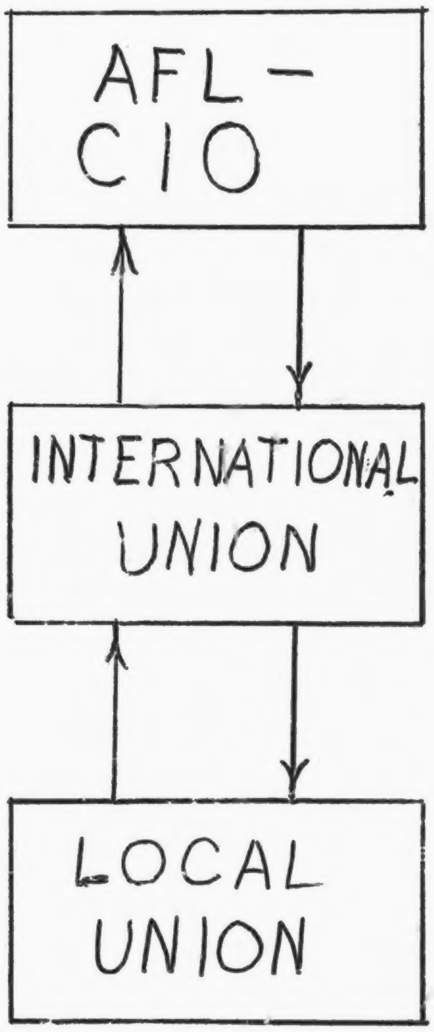
OFFICERS

David Sullivan [illegible]
George E. [illegible]

VICE-PRESIDENTS

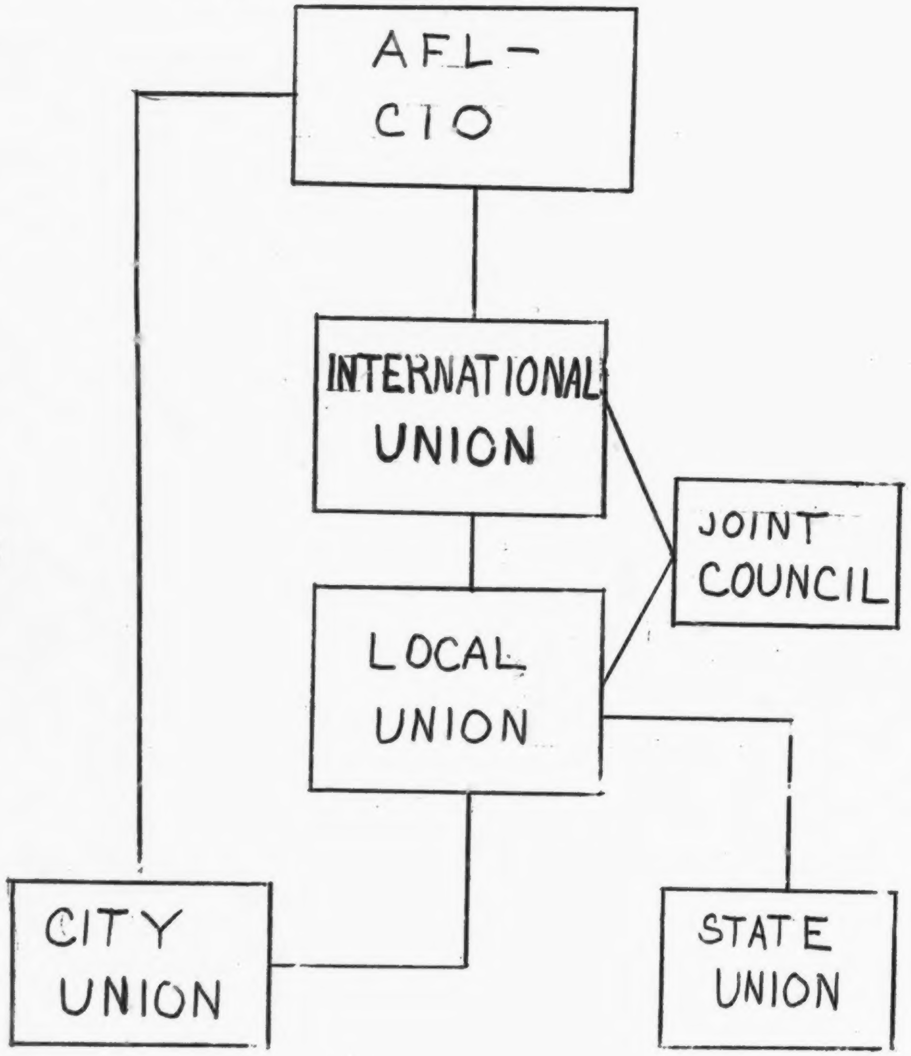
Thomas J. Burke
Charles C. [illegible]
Thomas Sh[illegible]
G[illegible] Har[illegible]
Albert G. Hearn
[illegible] A. [illegible]

RELATIONSHIP OF UNION ORGANIZATIONS

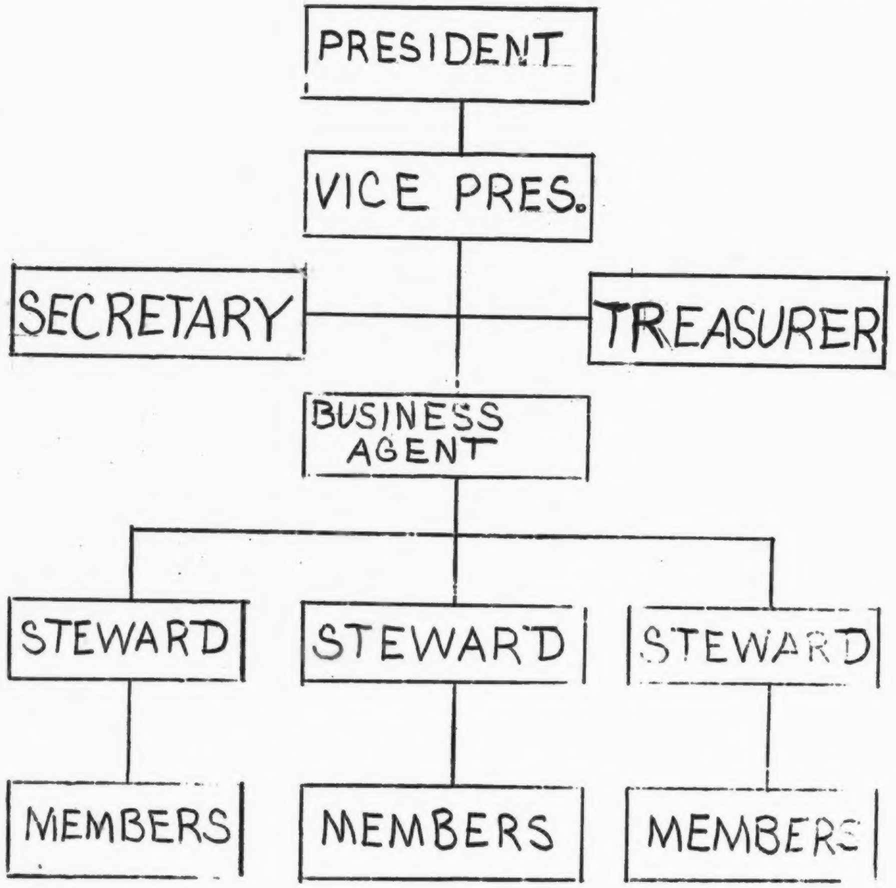

AFL-CIO
INTERNATIONAL UNION
LOCAL UNION

AFL – AMERICAN FEDERATION of LABOR
CIO – CONGRESS of INDUSTRIAL ORGANIZATIONS

RELATIONSHIP of UNION LEADERSHIP


AFL-CIO
INTERNATIONAL UNION
JOINT COUNCIL
LOCAL UNION
CITY UNION
STATE UNION

ORGANIZATION of LOCAL UNION


PRESIDENT
VICE PRES.
SECRETARY
TREASURER
BUSINESS AGENT
STEWARD
STEWARD
STEWARD
MEMBERS
MEMBERS
MEMBERS

RANK and FILE

Campcrafters
Inc.

UNFAIR
TO
ORGANIZED
LABOR

Campcrafters
Inc.

EMPLOYS
SCAB
LABOR

Campcrafters Inc.

REFUSES!

TO

RECOGNIZE

UNION

ON STRIKE

International

Camp
Equipment
Workers

AFL - CIO

ON STRIKE!

ICEW

(AFL
CIO)

Title: Safety in Industry and the Laboratory

Presentation:

Note: Safety becomes an integral part of all tool, machine and process lessons. It should be taught in these lessons when applicable.

I. Needs for safety

II. Organizations of safety

   A. National Safety Council

   B. Red Cross

   C. Insurance companies

III. Common safety precautions

   A. Rules of conduct

   B. Devices

      1. Goggles
      2. Shields and guards
      3. Ventilation
      4. Fire
         a. Extinguishers
         b. Fire drills
         c. Precautions

   C. First aid
      1. Training
      2. Where to receive

IV. Safe condition of tools and machines

V. Safe plant conditions

   A. Floor and benches

   B. Safety zones, color coding

   C. Material storage, product storage

VI. Transportation safety

   A. In plant

   B. Out of plant

References:

Amrine, Ritchey, Hulley, *Manufacturing Organization and Management*, pp. 352-357.

Cunningham and Holtrop, *Woodshop Tool Maintenance*, pp. 39-45

Groneman and Feirer, *General Shop*

Title: Maintenance Procedures

Presentation:

I. Definition - basic methods of daily preventive care of tools and machines to keep them in safe working order

II. Principles

  A. Tools arranged on panels according to use

    1. To prevent loss, return to proper place
    2. Arranged to prevent damage

  B. For safety reasons must be checked each time used

III. Organization

  A. Group works under simple personnel system for a clean place to work

  B. Machines and tools should have periodic maintenance

    1. Oiling
    2. Sharpening
    3. Cleaning
    4. Polishing

IV. Pupil activities

  A. Return tools to panels as soon as possible after use

  B. Demonstrate simple maintenance procedures on tools, machines, and equipment; e.g., oil, wipe, wax polish, clean, etc.

  C. Participate in clean-up operations in the laboratory

References:

Beryl M. Cunningham, etal, Woodshop Tool Maintenance, Chapters 2 and 20

Title: Common Cutting Processes

Presentation:

I. Definition: The process of removing material and changing its size or shape

II. Demonstrate the following tools:

- A. Auger bit - used for boring holes in wood
    1. Bore until point comes through or use backing piece
    2. Size marked by number 10, 11, 12, etc., meaning 10/16, 11/16, 12/16, etc.
- B. Countersink
    1. Enlarges surface portion of hole to take flathead screw
    2. Types for wood, metal, and other material
- C. Drill bit, twist - used for drilling holes in materials; e.g., wood, plastic, metal, etc.
- D. Back saw - used to cut across the grain of wood to obtain a smooth, fine cut
- E. Hack saw - used for cutting materials; e.g., metal and plastics
- F. Files
    1. Shapes: flat, half round
    2. Cut: single and double, aluminum file
- G. Bolt cutter - used for cutting small round rod, bar stock, square stock, hex stock

III. Machines used for cutting

- A. Squaring shear
    1. Used for cutting sheet materials
    2. Handle operated by hand to cut material
    3. Guide on side to hold material square
    4. Guide on back to cut a number of pieces to the same size
- B. Delta pattern tracer (wood lathe)
    1. Bolted to bed of lathe
    2. Tool operated by hand to follow a pattern

C. Belt sander with table

1. Material held square by hand and pushed against belt
2. Coarseness of paper and pressure determines speed of cut and smoothness

IV. Safety

A. Hand tools

1. Handle all cutting tools with care, they have sharp points and edges
2. Do not carry tools in your pockets or carry too many at one time
3. When through with a tool, return it to its proper place

B. Machine tools

1. Be careful of sharp edges
2. Keep fingers clear
3. Only one person at a machine at a time
4. Wear goggles
5. Never leave a power machine running when not in use

V. Pupil activities

A. Select and return tools to proper place

B. Use the proper cutting tools to manufacture a product

References:

Chris H. Groneman and John L. Feirer, General Shop, Section 1-4

Teaching Aids:

The tools listed

Title: Common Forming Processes

Presentation:

I. Definition: The changing of the shape or form of an object by stretching, bending, twisting, etc., without removing material.

II. Show and demonstrate the following forming and shaping tools:

  A. Anvil - a block of iron or steel used for bending metal and shaping heated metal

  B. Ball peen hammer

    1. Used for bending metal
    2. Used for forming metal
    3. Used for forming rivets

  C. Riveting hammer -- used for heading rivets

  D. Claw hammer - used for setting and drawing nails

  E. Carpenter's mallet - used for shaping and forming material; prevents marring surface

  F. Plastic soft-faced mallet - used for same processes as carpenter's mallet

  G. Rivet set - used to draw and form the head of a rivet

  H. Box and pan brake - used for bending sheet metal

  I. Vise - used to hold material while it is shaped

III. Safety with forming tools

IV. Pupil activities

  A. Pick up and return tools to proper place

  B. Use tools to manufacture a product

References:

Chris H. Groneman and John L. Feirer, General Shop, Sections 1-4

Title: Common Layout Processes

Presentation:

I. Layout tools - used to measure and layout the correct size and shape

II. Hand layout (those processes needed)

A. Show common tools on laboratory tool panel and demonstrate use

1. Sliding T-bevel - for marking angles
2. Outside calipers - measuring device used for checking diameters
3. Bench rules (wood and steel) - for measuring and marking materials
4. Sheet metal gauge - for measuring thickness of sheet metals
5. Center punch - for starting a drill
6. Prick punch - for marking points
7. Combination square
    a. For perpendicular lines
    b. Check and drawing an angle
    c. Finding the center of round stock
8. Tri-square - for perpendicular lines
9. Scriber - for marking lines, primarily on sheet metal
10. Scratch awl - for scratching lines
11. Pencil and chalk - for marking lines

B. Care of layout tools

1. Precision tools
2. Return to proper place

III. Safety

A. Do not carry in pockets

B. Return to proper place

C. Use only for jobs for which they have been designed

IV. Pupil Activity

A. Select and return tools to proper place

B. Use proper layout tools to manufacture a product

Reference:

Chris H. Groneman and John L. Feirer, General Shop, Section 1-4

Title: Common Holding Processes

Presentation:

I. Definition: A tool or machine used to hold your material while it is being worked on

II. Processes

- A. Jigs - used to hold the workpiece and guide the tool for cutting. Many pieces can be cut identically with a jig.
- B. Fixture - used to hold the workpiece only. The tool is guided by the machine used.
- C. Clamping - using clamps, vises, etc. to hold your work for cutting, forming, or shaping.

III. Holding tools

- A. Hand drill - used for holding drill bits for boring holes
- B. C-clamp
  - 1. A general-purpose clamp
  - 2. Holding material face to face
- C. Hand screw clamp - for general clamping
- D. Vise-grip wrench - can be locked onto the material being worked
- E. Drill press vise - expecially designed to use on the drill press
- F. Wood vise - designed to hold soft materials
- G. Machinist vise - designed to hold metal, primarily

IV. Safety

- A. Use properly
- B. Keep in good repair

V. Student activities

- A. Locate and name the holding tools and machines he will use in the manufacture of a product
- B. Demonstrate safe use of each tool used for holding
- C. Use holding tools in the manufacture of a product

References:

Georgia Department of Education, Industrial Arts for the Middle Grades, pp. 75-79

Chris H. Groneman and John L. Feirer, General Shop, Section 1-4

Teaching Aids:

Sample jigs and fixtures

Title: Common Finishing Techniques

Presentation:

I. Definition - materials used to protect and beautify products

II. Techniques

  A. Polishing - removal of dulling surface factors to beautify the product

  B. Sanding - the procedure for smoothing materials in preparation for applying finishing material

  C. Dip finish - dip wood parts into penetrating-type finish and wipe dry

III. Safety

  A. Protect eyes

  B. Clean hands and work area

IV. Student activities

  A. Locate and name the finishing tools and procedures he will use in the manufacture of a product

  B. Demonstrate safe use of each tool used for finishing

  C. Use finishing tools in the manufacture of a product

  D. Use finishes on the product he is to manufacture

References:

Adnah C. Newell, Coloring, Finishing and Painting of Wood, Chapters 19-20

Title: Common Assembly Techniques

Presentation:

I. Definition: putting together all parts that have been manufactured

II. Techniques

A. Pop riveting

1. Special tool used
2. Special rivet for soft material
3. For light work

B. Peened riveting

1. Slower than pop riveting, but stronger
2. Rivet set and ball peen hammer used for forming head

C. Force fit

1. Hole slightly smaller to receive male part
2. Used for handles, drive pins, etc.

III. Safety

A. Keep tools in good condition

B. Watch your fingers

IV. Student activities

A. Locate and name the assembly tools he will use in the manufacture of a product

B. Demonstrate safe use of each tool used for assembly

C. Use assembly tools in the manufacture of a product

References:

Georgia Department of Education, Industrial Arts for the Middle Ages, pp. 59-62

Chris H. Groneman and John L. Feirer, General Shop, p. 201

Title: Functions and Activities of the Marketing Division of a Corporate Manufacturing Industry

Presentation:

I. Market Research

  A. Who and where the customer is

  B. What he needs

  C. What he wants

  D. What he will buy

  E. Where and how he will buy

  F. How much will he pay

II. Sales

  A. What advertising messages have greatest appeal

  B. Where should message be placed

III. Advertising

  A. Promotes a product

  B. Proper placement of advertisement

IV. Distribution

  A. Direct to user who may be an individual, a company, or another manufacturer

  B. Through wholesaler or jobber, who in turn sells to retailers or to other manufacturers

V. Service

  A. New product development

  B. Improvement of present products

  C. New uses for old products

  D. Competitive customer preferences

  E. Product elimination or simplification of lines

  F. Naming of product

VI. Student Activities

A. Examine packages for various products

B. Develop a package for a product

C. Develop an advertising display

D. Develop a TV commercial

1. Spoken
2. Singing

References:

Amrine, Ritchey, Hulley, _Manufacturing Organization and Management_, pp. 493, 499, 503, 507

Teaching Aids:

Various packages and boxes for display

Pass-out sheet on marketing, with assignments

MARKETING

Student Activity Sheet

TOPIC: PACKAGING AND SELLING OF SPATULA

EXPLANATION: Well-planned marketing processes are a "Pathway to Profits" according to the General Electric Marketing Services Division.

We, the Campcrafters, Inc. of Gorham State College, have a product to sell and we must make a profit if we are to remain in business. Through advertising, we will be able to promote our product and the potential buyer will gain the following information:

1. The fact that our product exists
2. Where our product can be purchased
3. What our product will do
4. Price of our product
5. How to care for our product
6. Expected durability (length of life) of our product

STUDENT ACTIVITY CHOICE: Select one of the following topics and prepare it to present to the Board of Directors of Campcrafters, Inc. on ______________________.
Date

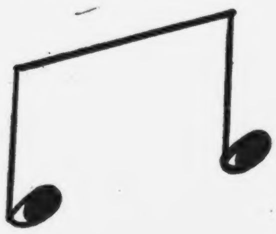
1. Prepare a script for a TV commercial to advertise our product.
2. Design an attractive (simple and inexpensive) package and label for our spatula.
3. Design, sketch, and color an attractive poster to promote the sale of our spatula.

Happiness
C A M
C R A F T E R S

"The Campcrafters"

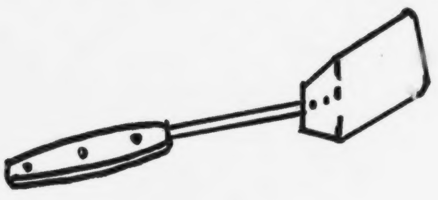
SINGING THEIR

Original
LOONEY TOONEY

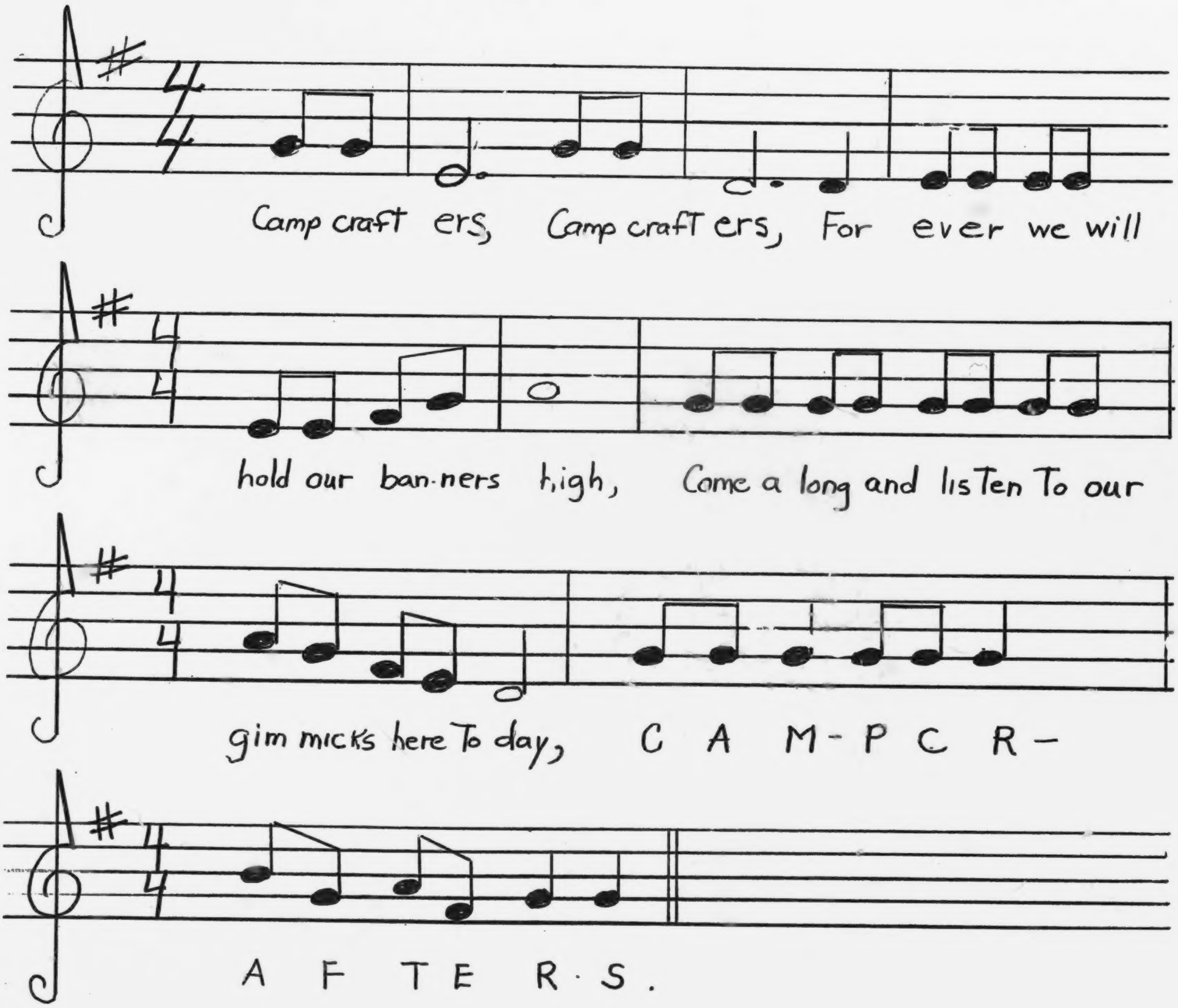


CAMPCRAFTERS!

SUNG TO MICKEY MOUSE TUNE (CHORUS)



GSC



Camp craft ers, Camp craft ers, For ever we will
hold our ban-ners high, Come a long and lis ten to our
gim micks here to day, C A M - P C R -
A F T E R S.

GORHAM - LOONEY TOONEY

"ADVERTISING DITTY"

MICKEY MOUSE, MICKEY MOUSE,
FOREVER LET US HOLD OUR BANNER HIGH.
COME ALONG AND SING THIS SONG
AND JOIN OUR JUBILEE
M I C....K E Y....M O U S E

CAMPCRAFTERS, CAMPCRAFTERS
FOREVER LET US HOLD OUR BANNER HIGH.
COME ALONG AND LISTEN TO
OUR GIMMICK HERE TODAY.
C A M....P C R....A F T E R S

UNIT EVALUATION:

The following test items are suggested for a final test to aid in the evaluation of the pupils. The enclosed answer sheet is used for ease in grading.

EVALUATION of the pupils' understanding and participation in this unit of work shall be done in three ways:

I. Written tests and examinations (40%)

During the time that this unit is being taught, it is expected that short quizzes be given over specific lessons and outside readings and assignments. At the close of the unit, a final examination shall be given. These quizzes and the final test shall include objective as well as essay type questions so that all students will have equal opportunity to express their understanding of the material covered.

II. Laboratory and outside activities (40%)

During the course of this unit, there will be many varied opportunities for students to develop greater understandings and show creative talent through homework and laboratory assignments. These should be evaluated according to the student's demonstrated ability.

III. Class laboratory participation and social attitude development (20%)

One of the objectives of this unit is the development of proper attitudes about the pupil's place in the industrial technical society. The evaluation of this can best be done by the observation of the student as he relates to his fellow students. The instructor must be careful to make the evaluation of social attitude development as objective as possible, keeping in mind that it may be impossible not to let some subjective opinions sway his thinking.

FINAL TEST

An answer sheet is provided with this test. Do not make any pen or pencil marks on the test itself. Be sure you fill out the information asked for at the top of the answer sheet.

Multiple Choice: Read the first part of the statement, then read all of the second parts (lettered) and select the one that best completes the statement. If you select "a," make a good heavy dot in the "a" column on your answer sheet after the proper number. If you select "b," "c," or "d," make a heavy dot in the proper column after the proper number. There is only one correct answer for each statement.

1. Workmen's compensation is paid for by:
   a. The employer
   b. The worker
   c. The government
   d. Both the employer and the employee

2. Social security is paid for by:
   a. The employer
   b. The Worker
   c. The government
   d. Both the employer and the employee

3. The line used to indicate the visible edges of working drawings is called:
   a. Extension line
   b. Center line

4. A product found by quality control to have a minor defect is set aside for:
   a. Scrap
   b. Rework
   c. Packaging
   d. Sale

5. A sharp tool is
   a. Dangerous
   b. Pretty
   c. Safe
   d. None of the above

6. A device used to hold the workpiece while the tool is guided by a machine is called a:
   a. Fixture
   b. Jig
   c. Chuck
   d. Cutting tool

7. A drawing that is not a pictorial drawing is:
   a. Isometric
   b. Perspective
   c. Oblique
   d. Orthographic

8. The unit used for figuring the cost of lumber is:
   a. Pound
   b. Foot
   c. Board foot
   d. Square foot

9. The first person to whom a grievance is reported in a union shop is the:
   a. Foreman
   b. Shop steward
   c. Personnel manager
   d. President

10. A design is functional when it:
   a. Is beautiful
   b. Is unusual
   c. Is new
   d. Works well

11. The amount of income tax is determined by:
   a. Percent of income
   b. So much per person
   c. Amount of personal property
   d. Type of job

12. The aesthetic value of design refers to:
   a. Long wearing quality
   b. Appearance
   c. Workability
   d. Cost

13. A first line supervisor is the same as:
   a. Manager
   b. Shop steward
   c. Foreman
   d. Vice president

14. Which one of the items below does not fit the p purpose of unions?
   a. Better wages
   b. Better working conditions
   c. Company profit
   d. Better retirement benefits

15. Tools on a panel should be arranged:
   a. To prevent damage
   b. By alphabetical order
   c. By make of tool
   d. By size

16. Which tool listed below is not a cutting tool?
   a. Auger bit
   b. Hand drill
   c. File
   d. Hack saw

17. A ball peen hammer is a:
   a. Layout tool
   b. Cutting tool
   c. Holding tool
   d. Forming tool

18. A tool or machine used to hold material while it is being worked on is called a:
   a. Cutting tool
   b. Finishing tool
   c. Forming tool
   d. Holding tool

19. A product schedule is used to:
   a. Assure the product is completed on time
   b. Prevent damage
   c. Prevent a safety hazard
   d. Figure cost

20. Want ads tell a person:
   a. What questions to ask when applying
   b. Which companies are reliable
   c. Companies not to work for
   d. The jobs available

21. The stockholder holding the majority of shares in a company:
   a. Has controlling interest
   b. Pays the bills
   c. Is the president
   d. Orders all materials

22. A normal working day is from 8 a.m. to 4:30 p.m. If one hour is taken for lunch and a 15 minute coffee break is used in the morning and also one in the afternoon, how much time is devoted to actual production?
   a. 7.5 hours
   b. 7 hours
   c. 6.5 hours
   d. 6 hours

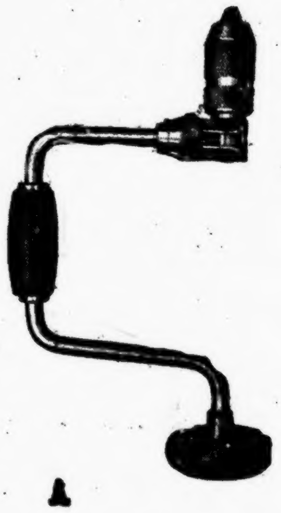
Final test: (cont'd)

Matching: Select the correct picture to go with the name after the number. On your answer sheet make a heavy dot in the proper column (a,b,c or d) after the proper number.

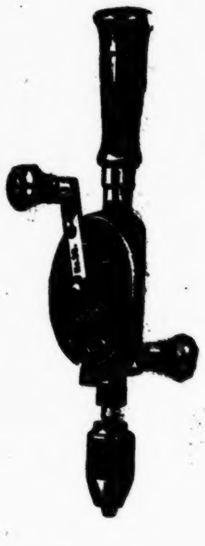
23. pop riveter

24. drill press

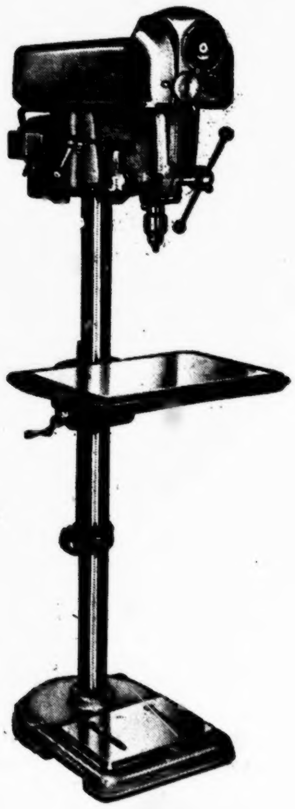
25. brace



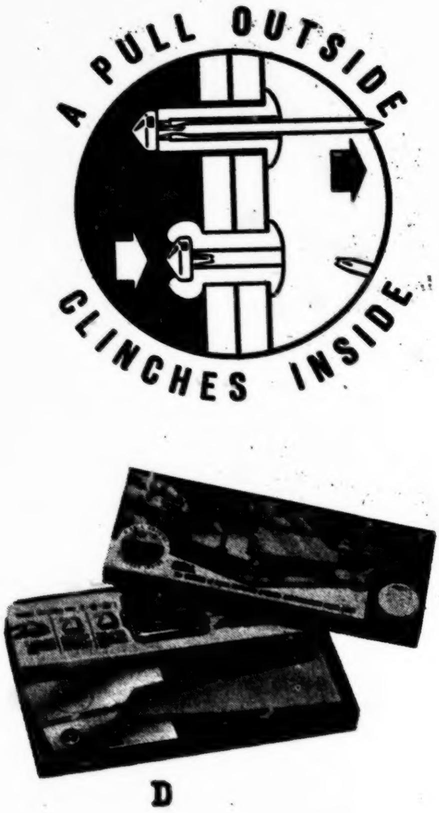
A



B



C


A PULL OUTSIDE
CLINCHES INSIDE

D

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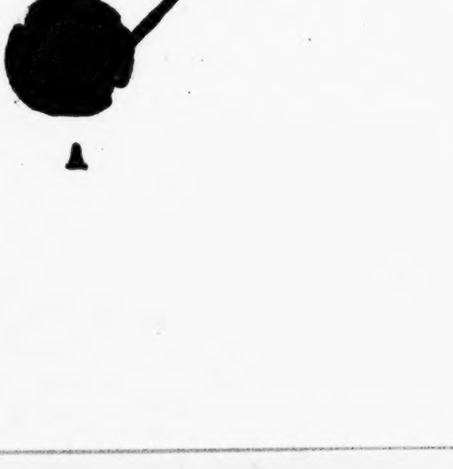
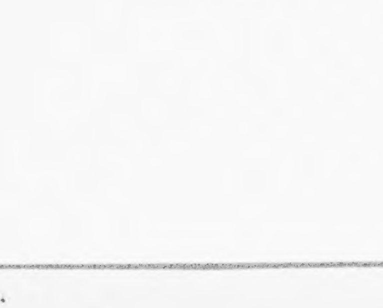
26. to protect your eyes

27. to measure the thickness of sheet metal

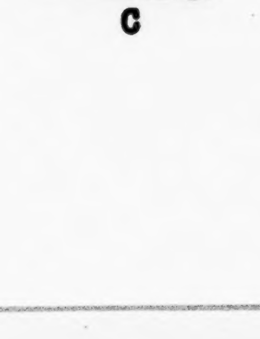
28. to start and stop power machines



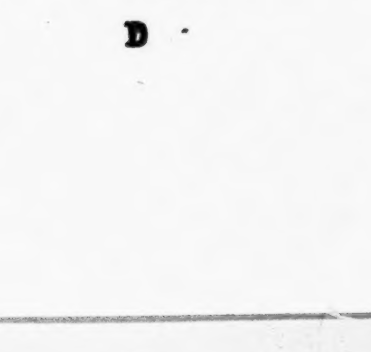
A



B



C


THE L.S. STARRETT CO.
ATHOL, MASS. U.S.A.
U.S. STANDARD GAGE
No 283

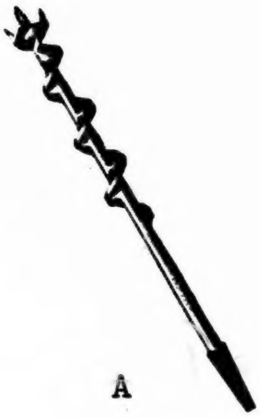
D

Final test (cont'd)
Matching: (cont'd)

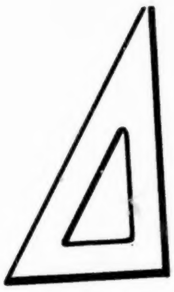
29. a cutting tool

30. used to clean

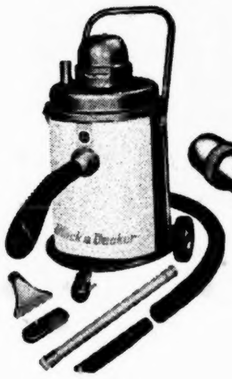
31. a holding tool



A



B



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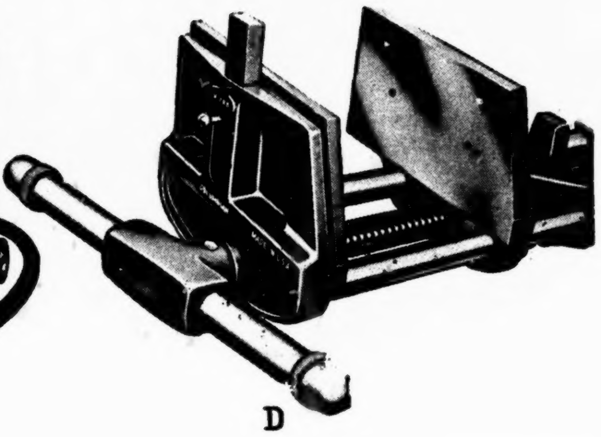

D

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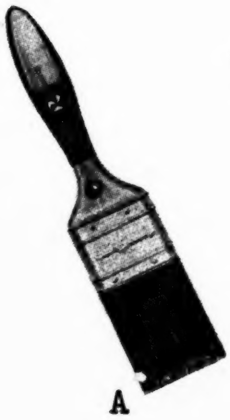
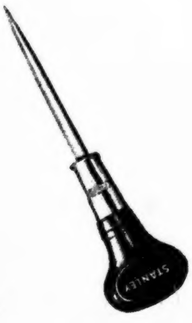
32. to draw horizontal lines

33. a finishing tool

34. a layout tool



A



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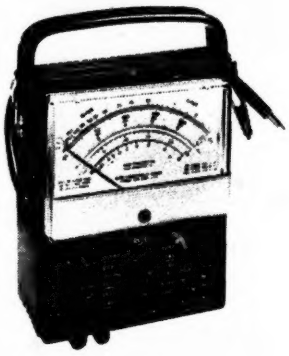

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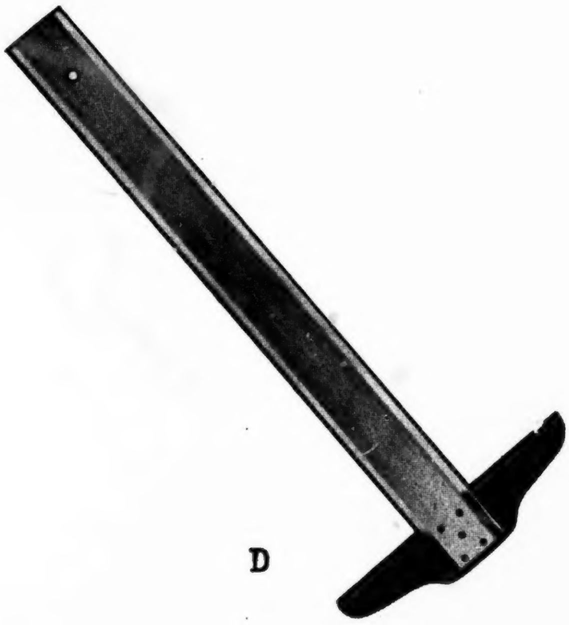


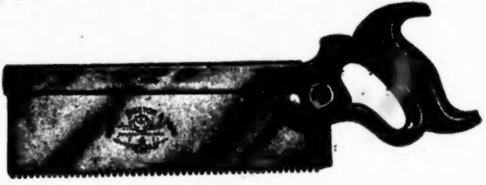
D

Final test: (cont'd)
Matching: (cont'd)

35. C-clamp

36. back saw

37. bench rule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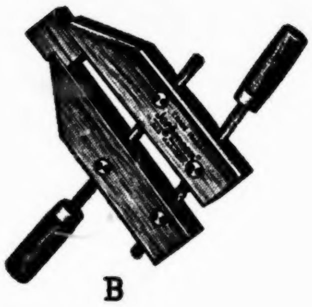
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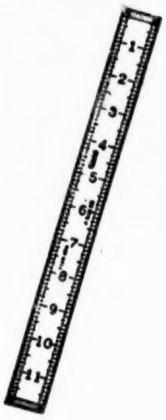
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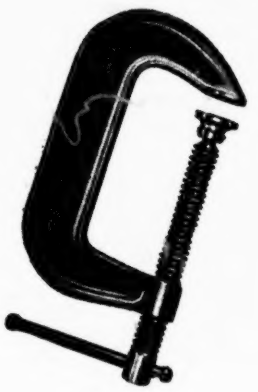
D

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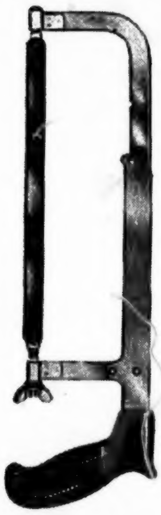
38. hack saw

39. ball peen hammer

40. mill file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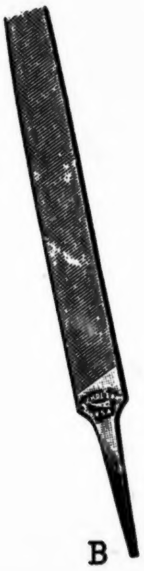
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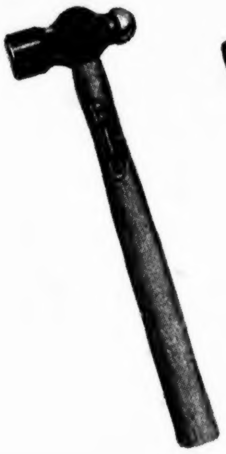
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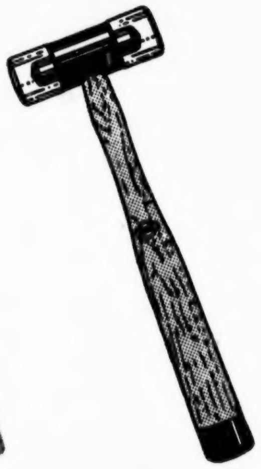
D

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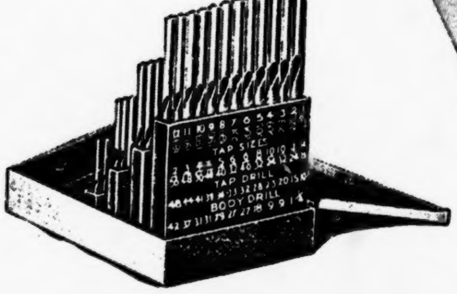
41. drill index

42. drill vise

43. T-bevel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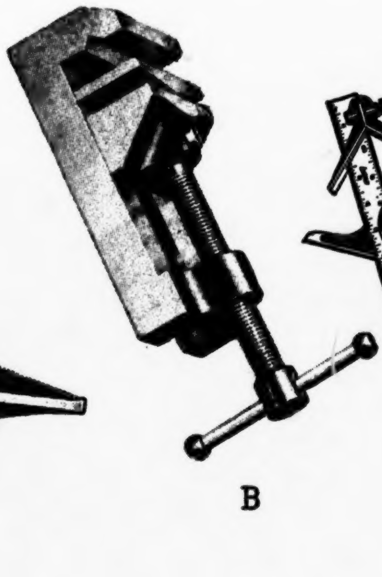
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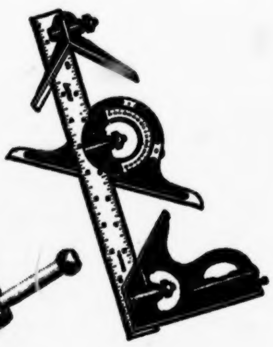
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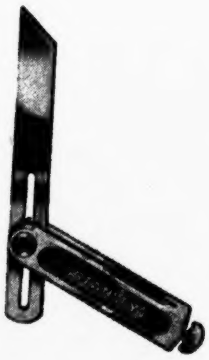
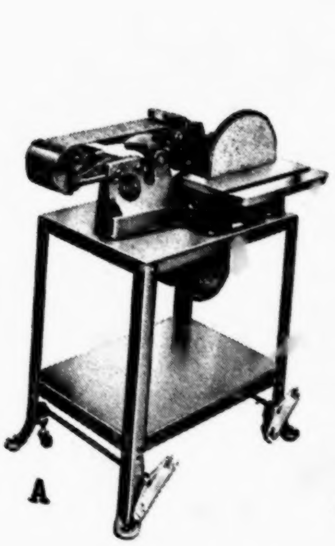

D

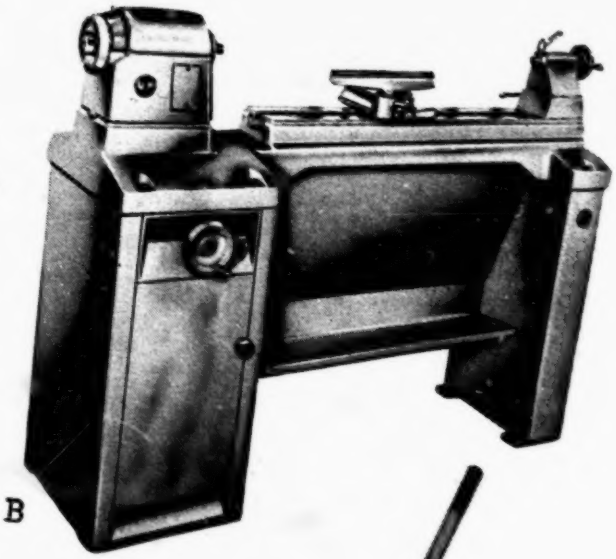
Final test: (cont'd)
Matching: (cont')

44. wood lathe

45. squaring shear

46. belt and disc sander


A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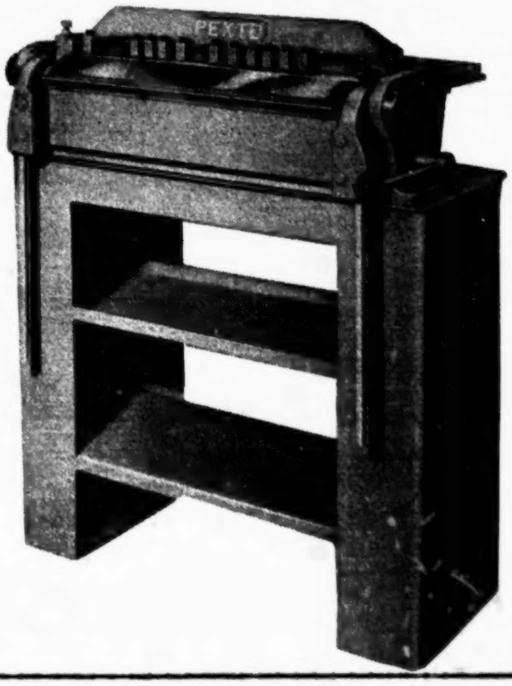

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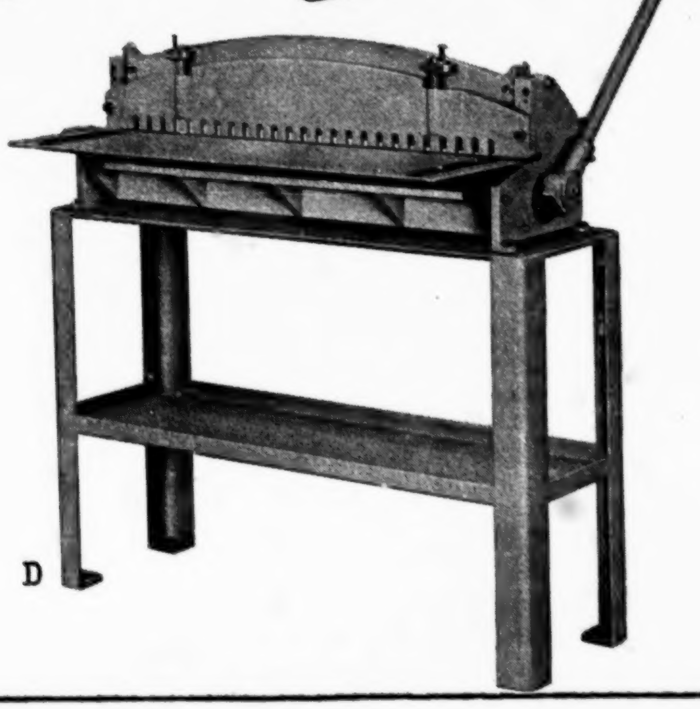
D

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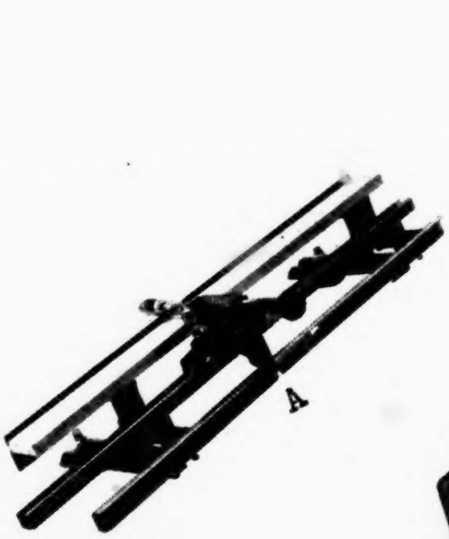
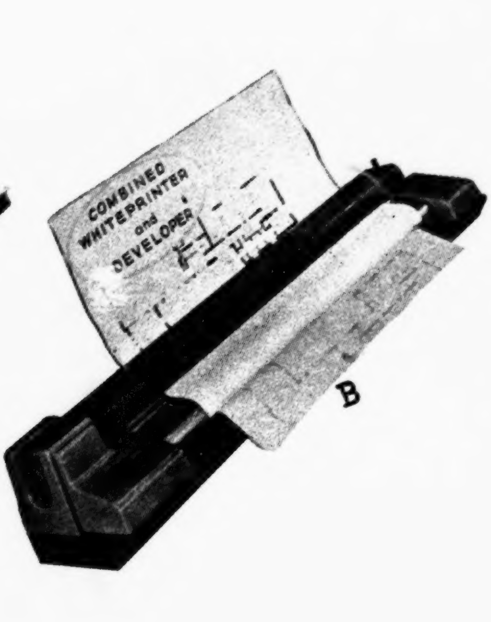
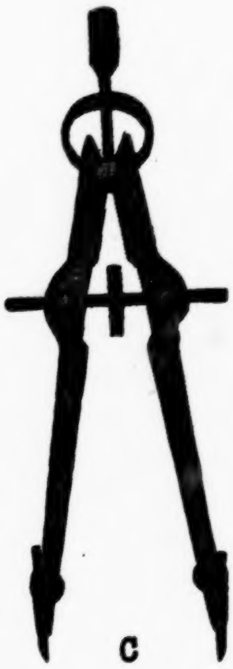
47. bow compass

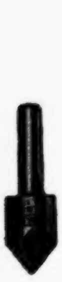
48. countersink

49. lathe duplicator


A


COMBINED
WHITEPRINTER
and
DEVELOPER
B


C


D

Final test: (cont'd)
Matching: (cont'd)

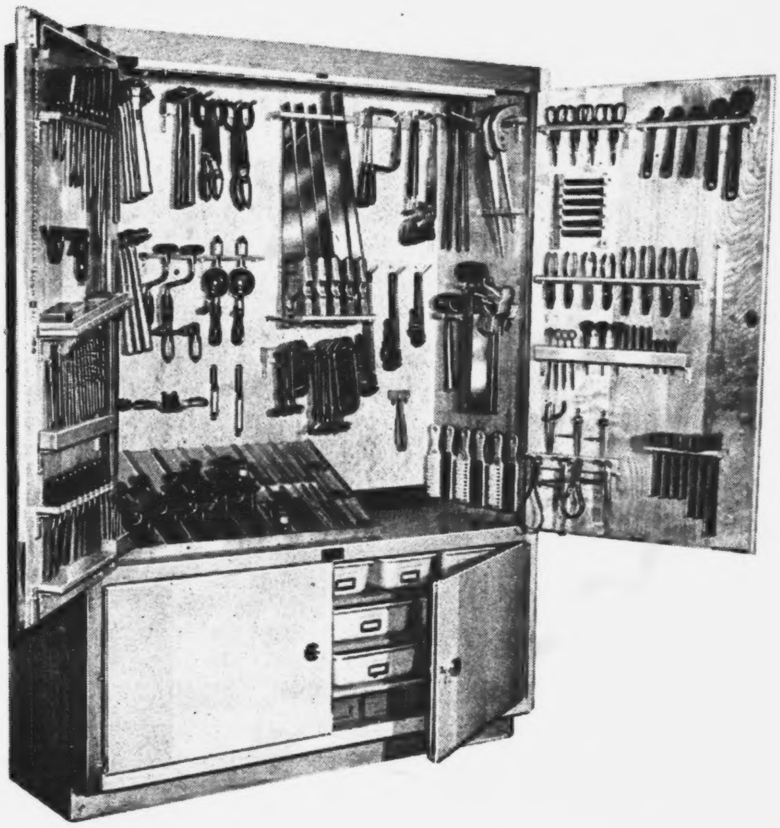
50. This picture is a:

A. storage cabinet

B. locker

C. manufacturing tool panel

D. storage shed



True or False: Read the following statements carefully. If the statement is true, make a heavy black dot in the "T" column on your answer sheet after the proper number. If the statement is false, make a heavy black dot in the "F" column on your answer sheet after the proper number.

1. The engineering division makes the blueprints for the production of a product.
2. The president of a corporation owns the corporation.
3. The personnel division does the interviewing and hiring of help.
4. The primary purpose of the quality control department is to prevent poor quality workmanship.
5. Most tools can be grouped under the following headings: layout, cutting, forming, holding, assembly, and finishing.
6. Tool maintenance is the job of the foreman.
7. Selling stock in a company is a method of loaning money.
8. A bond holder in a company is part owner of that company.
9. A stock holder does not have voting rights in a corporation.
10. Money paid for working by the hour is called wages.

Completion: In the statement below a word, or words, have been left out where the blanks are. Write the correct word, or words, in the proper blank on the answer sheet.

1. Drawing is (a)(an)_______ language.
2. The drawings used to produce a product are called _________ drawings.
3. A machine used for bending sheet metal is called (a) (an) ______________.
4. Tools used to measure and layout the correct size and shape of an object are called __________ tools.

5. The devices used to guide the tools for cutting so that many pieces can be made identically are called __________.

6-7. Two reasons for applying finish to wood are ____(6)____ and ____(7)____.

8. A device used to hold pieces while machining a product is called (a) (an) __________.

9. A stock exchange is a place where __________ meet to buy and sell stocks and bonds.

10. Stainless steel was used on our spatula because it does not __________.

Essay Questions: Answer the following questions in complete sentences on the paper provided.

1. Describe the process that a product goes through from the time that it is just an idea until you buy it in the store.

2. Why is packaging of a product so important to a manufacturing industry?

3. What does the personnel division of an industry do? List at least three of its responsibilities.

4. Explain any four of the following terms:
   - a. Product design
   - b. Quality control
   - c. Tooling methods
   - d. Plant maintenance
   - e. Work schedule
   - f. Plant safety
   - g. Flow chart
   - h. Time study

5. Place the following terms in their proper spaces on the line and staff organization sheet (after the answer sheet).

President
Plant Superintendent
Employee
Sales and Market Manager
Employee
Blade Foreman
Board of Directors
Assembly, Finish and Packaging Foreman
Handle Foreman
Finance Manager
Tang Foreman
Employee
Manufacturing Foreman
Quality Control Manager
Employee
Employee Relations Manager
Engineering Research and Development Manager

DATE__________ NAME______________________________

TEST NO.________ AREA____________ SCORE____________ PERIOD__________

INDUSTRIAL ARTS EXAM

	A	B	C	D
1.	☐	☐	☐	☐
2.	☐	☐	☐	☐
3.	☐	☐	☐	☐
4.	☐	☐	☐	☐
5.	☐	☐	☐	☐
6.	☐	☐	☐	☐
7.	☐	☐	☐	☐
8.	☐	☐	☐	☐
9.	☐	☐	☐	☐
10.	☐	☐	☐	☐
11.	☐	☐	☐	☐
12.	☐	☐	☐	☐
13.	☐	☐	☐	☐
14.	☐	☐	☐	☐
15.	☐	☐	☐	☐
16.	☐	☐	☐	☐
17.	☐	☐	☐	☐
18.	☐	☐	☐	☐
19.	☐	☐	☐	☐
20.	☐	☐	☐	☐
21.	☐	☐	☐	☐
22.	☐	☐	☐	☐
23.	☐	☐	☐	☐
24.	☐	☐	☐	☐
25.	☐	☐	☐	☐

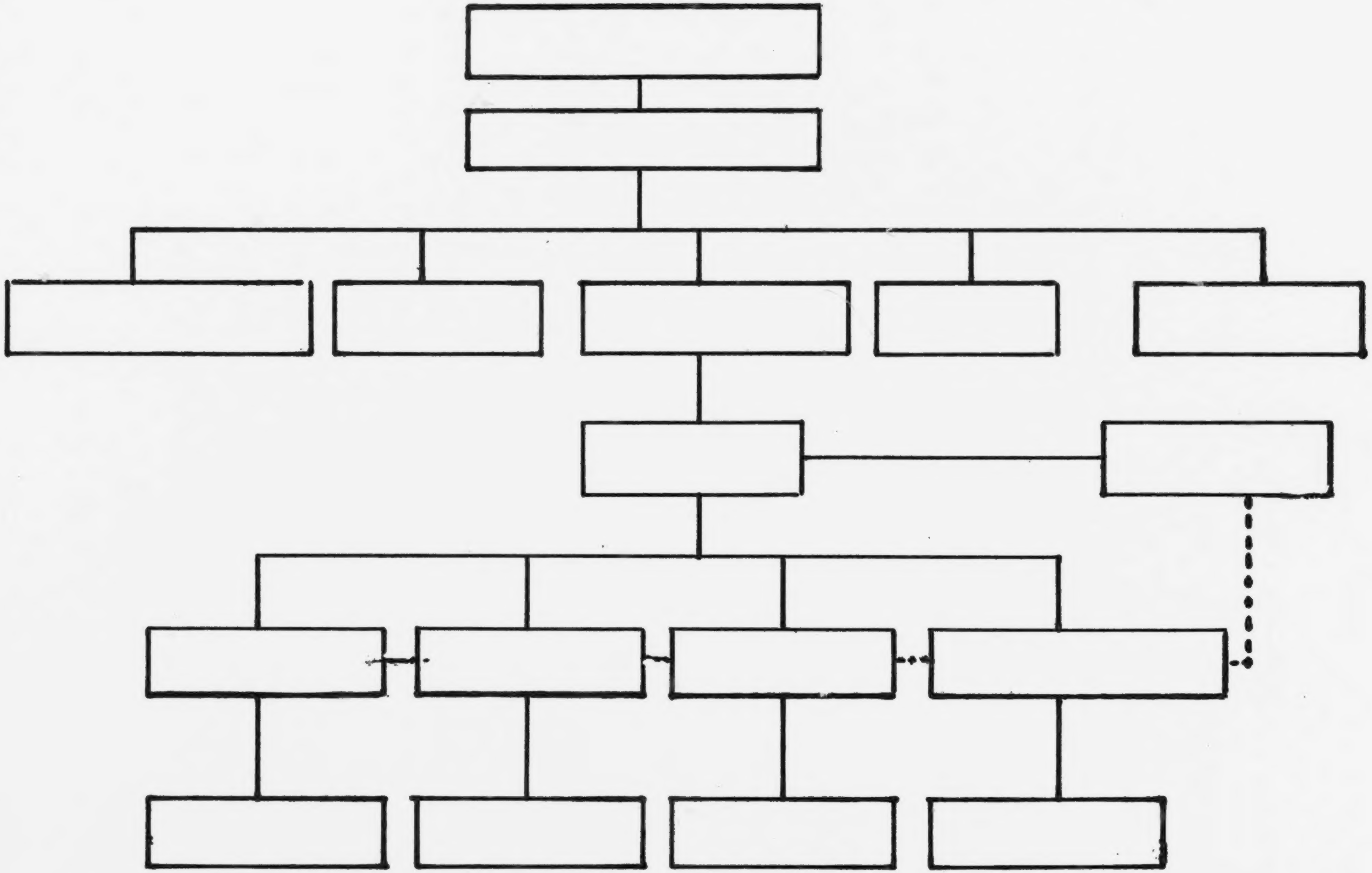
	A	B	C	D
26.	☐	☐	☐	☐
27.	☐	☐	☐	☐
28.	☐	☐	☐	☐
29.	☐	☐	☐	☐
30.	☐	☐	☐	☐
31.	☐	☐	☐	☐
32.	☐	☐	☐	☐
33.	☐	☐	☐	☐
34.	☐	☐	☐	☐
35.	☐	☐	☐	☐
36.	☐	☐	☐	☐
37.	☐	☐	☐	☐
38.	☐	☐	☐	☐
39.	☐	☐	☐	☐
40.	☐	☐	☐	☐
41.	☐	☐	☐	☐
42.	☐	☐	☐	☐
43.	☐	☐	☐	☐
44.	☐	☐	☐	☐
45.	☐	☐	☐	☐
46.	☐	☐	☐	☐
47.	☐	☐	☐	☐
48.	☐	☐	☐	☐
49.	☐	☐	☐	☐
50.	☐	☐	☐	☐

	T	F
1.	☐	☐
2.	☐	☐
3.	☐	☐
4.	☐	☐
5.	☐	☐
6.	☐	☐
7.	☐	☐
8.	☐	☐
9.	☐	☐
10.	☐	☐

COMPLETION

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________

ORGANIZATION OF CAMPCRAFTERS, INC.



TEST ANSWER SHEET

DATE ____________ NAME KEY

TEST NO. FINAL AREA ____________ SCORE ____________ PERIOD ____________

INDUSTRIAL ARTS EXAM

	A	B	C	D
1.	●	·	·	·
2.	·	·	·	●
3.	·	·	●	·
4.	·	●	·	·
5.	·	·	●	·
6.	●	·	·	·
7.	·	·	·	●
8.	·	·	●	·
9.	·	●	·	·
10.	·	·	·	●
11.	●	·	·	·
12.	·	●	·	·
13.	·	·	●	·
14.	·	·	●	·
15.	●	·	·	·
16.	·	●	·	·
17.	·	·	·	●
18.	·	·	·	●
19.	●	·	·	·
20.	·	·	·	●
21.	●	·	·	·
22.	·	●	·	·
23.	·	·	·	●
24.	·	·	●	·
25.	●	·	·	·

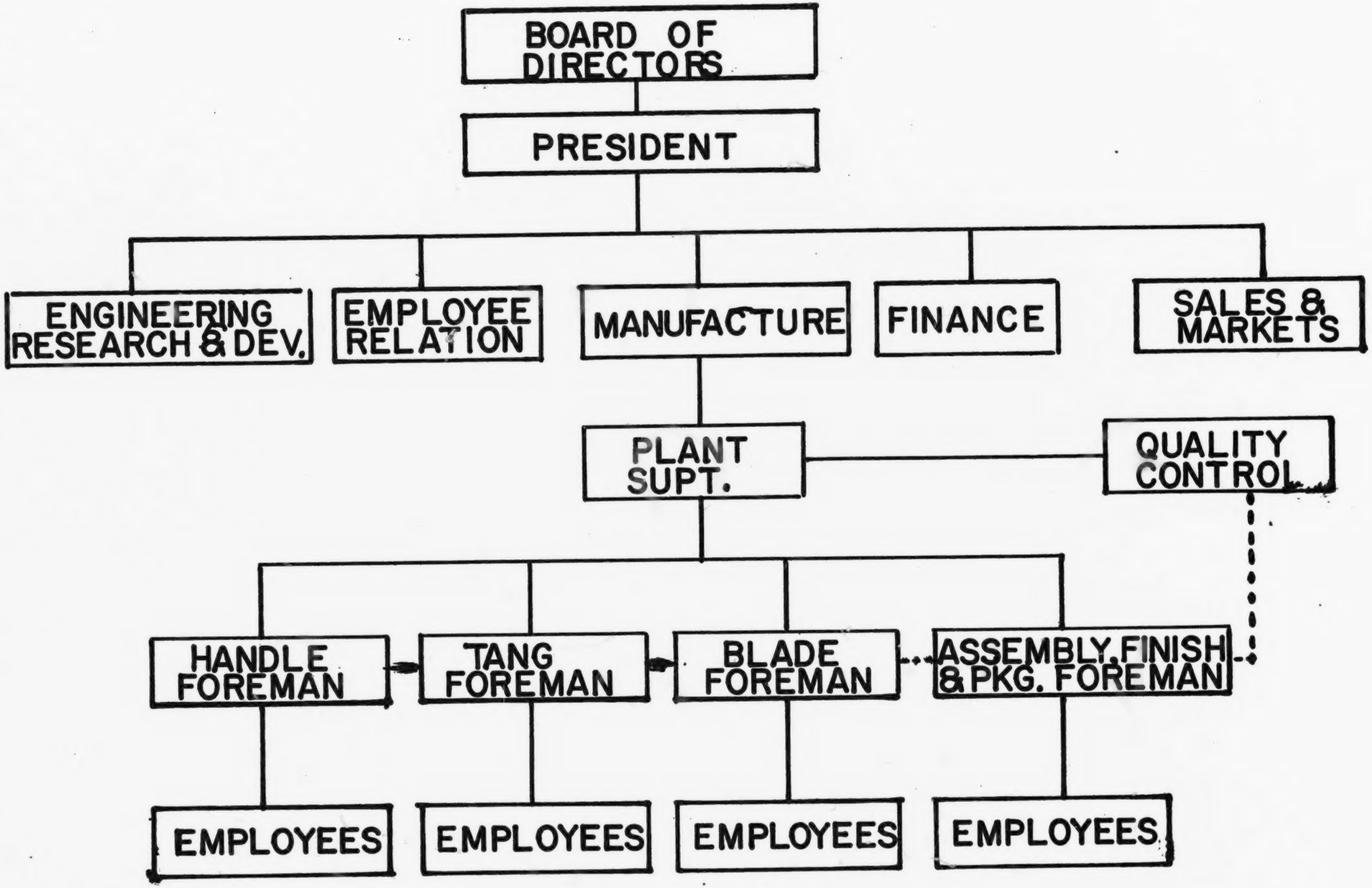
	A	B	C	D
26.	·	●	·	·
27.	·	·	·	●
28.	·	·	●	·
29.	●	·	·	·
30.	·	·	●	·
31.	·	·	·	●
32.	·	·	·	●
33.	●	·	·	·
34.	·	●	·	·
35.	·	·	·	●
36.	●	·	·	·
37.	·	·	●	·
38.	●	·	·	·
39.	·	·	●	·
40.	·	●	·	·
41.	●	·	·	·
42.	·	●	·	·
43.	·	·	·	●
44.	·	●	·	·
45.	·	·	·	●
46.	●	·	·	·
47.	·	·	●	·
48.	·	·	·	●
49.	●	·	·	·
50.	·	·	●	·

	T	F
1.	●	·
2.	·	●
3.	●	·
4.	●	·
5.	●	·
6.	·	●
7.	·	●
8.	●	·
9.	·	●
10.	●	·

COMPLETION

1. international - or universal
2. working
3. box & pan brake - or bar folder
4. layout
5. jigs
6. protection or appearance
7. appearance or protection
8. fixtures
9. brokers
10. rust

ORGANIZATION OF CAMPCRAFTERS, INC.


BOARD OF DIRECTORS
PRESIDENT
ENGINEERING RESEARCH & DEV.
EMPLOYEE RELATION
MANUFACTURE
FINANCE
SALES & MARKETS
PLANT SUPT.
QUALITY CONTROL
HANDLE FOREMAN
TANG FOREMAN
BLADE FOREMAN
ASSEMBLY, FINISH & PKG. FOREMAN
EMPLOYEES
EMPLOYEES
EMPLOYEES
EMPLOYEES

ANSWER SHEET: Essay questions

1. a. idea
   b. sketch
   c. models
   d. select final idea
   e. engineering drawings
   f. make tools
   g. buy material
   h. make product
   i. package product
   j. ship product to retail outlet
   k. sell product in store

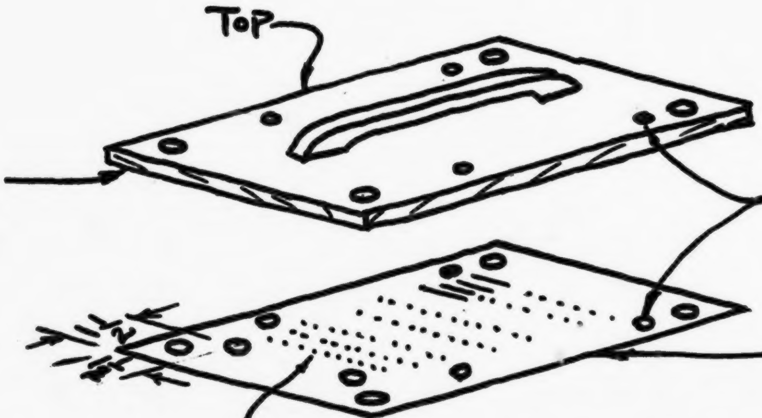
2. a. protect item
   b. eye appeal
   c. advertising
   d. directions for use
   e. guarantees printed on package
   f. safety
   g. identifies trade marks

3. a. hires and fires employees
   b. keeps employee records
   c. training of employees
   d. union negotiations
   e. employee relations (social, counseling, safety)

4. a. Product design - planning a new product
   b. Quality control - see that the customer gets a product that is of a quality he is willing to pay for
   c. Tooling methods - making of special tools, jigs and fixtures
   d. Plant maintenance - keeping tool, machines, equipment and plant clean and in good working order
   e. Work schedule - list of operations to be performed and the time that they are to be done
   f. Plant safety - program to be followed to keep all personnel safe from physical harm while working on the job
   g. Flow chart - the chart of motion of the parts as they pass through a mass production industry
   h. Time study - an accurate timing of each operation necessary to produce a product

EASY SCORE- ANSWER SHEET DEVICE

PUNCHES HOLES IN ANSWER SHEETS

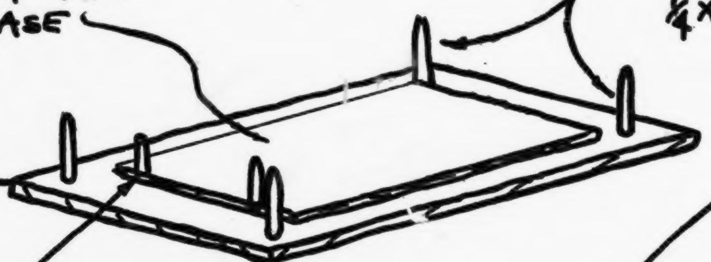


¾ x 10¾ x 13¼
BIRCH PLY

FASTEN PLATE TO TOP
WITH 3/16" x 1" MACHINE BOLTS
& WING NUTS

STEEL PLATE 10½ x 13 16 GA.

LAYOUT ALL HOLES FROM ANSWER SHEET
USE PRICK PUNCH TO LOCATE CENTER OF ANSWERSHEET BLOCKS.
PLACE TACKS POINT DOWN THROUGH HOLES,
USE #8 UPHOLSTRY TACKS

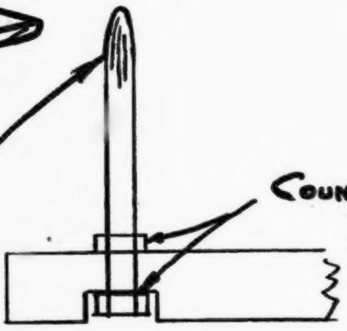


WASTE CEILING TILE
TACKED ON BASE

FOUR CORNER GUIDE PINS
¼ x 3½ BOLTS

¾ x 12½ x 14¾
BIRCH PLY

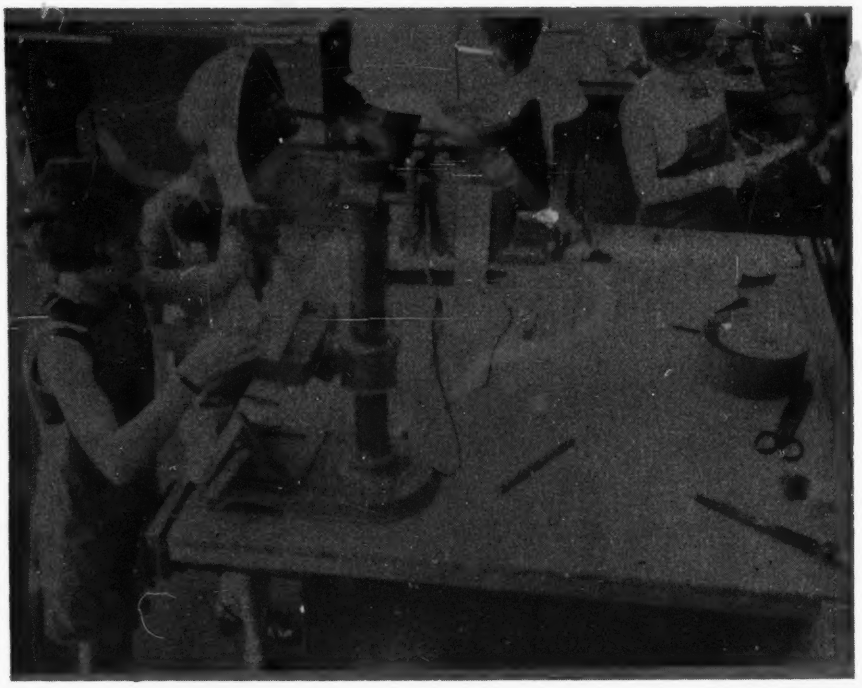
TWO ¼" BOLTS, FILE ON DRILL
PRESS FOR PAPER ALIGNMENT
LOCATE AFTER DESIGNING YOUR OWN
ANSWER SHEET



COUNTERBORE
&
DOUBLE NUT

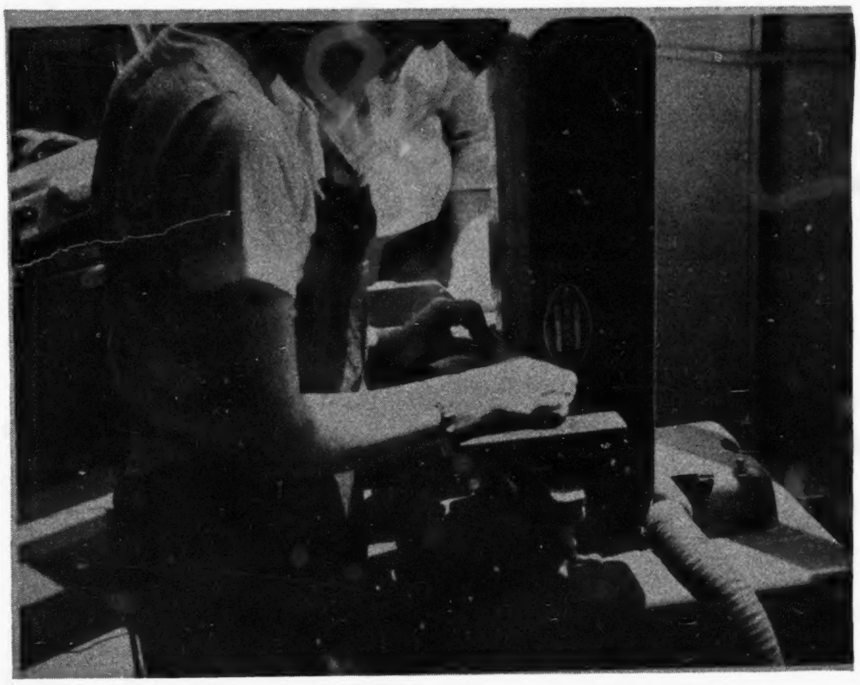
CUT OFF BOLT HEAD
AND FILE TO BULLET
SHAPE USING DRILL PRESS

EXAMPLES OF PUPIL WORK DEVELOPED DURING THE COURSE OF THIS UNIT



COUNTERSINKING

ASSEMBLY

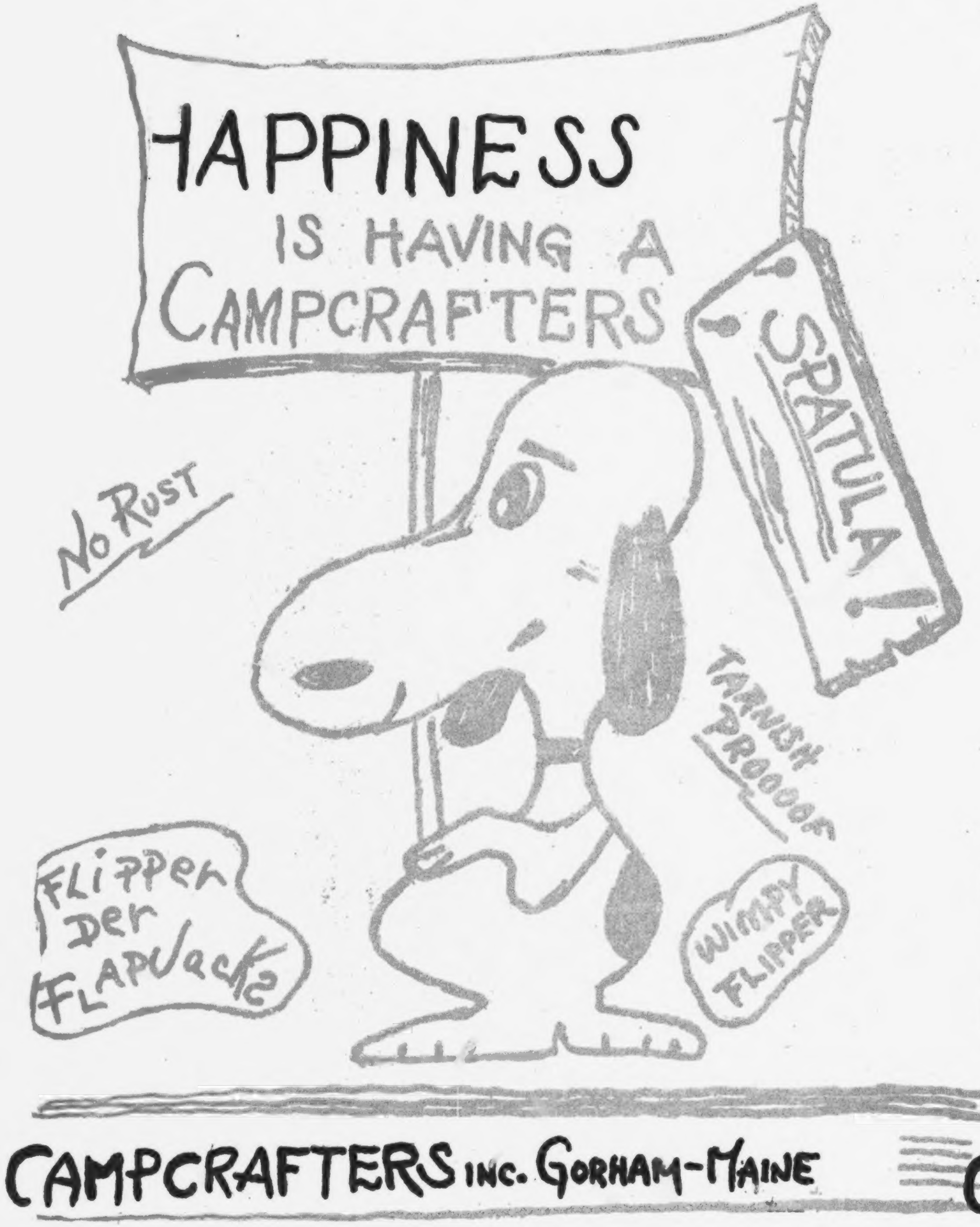


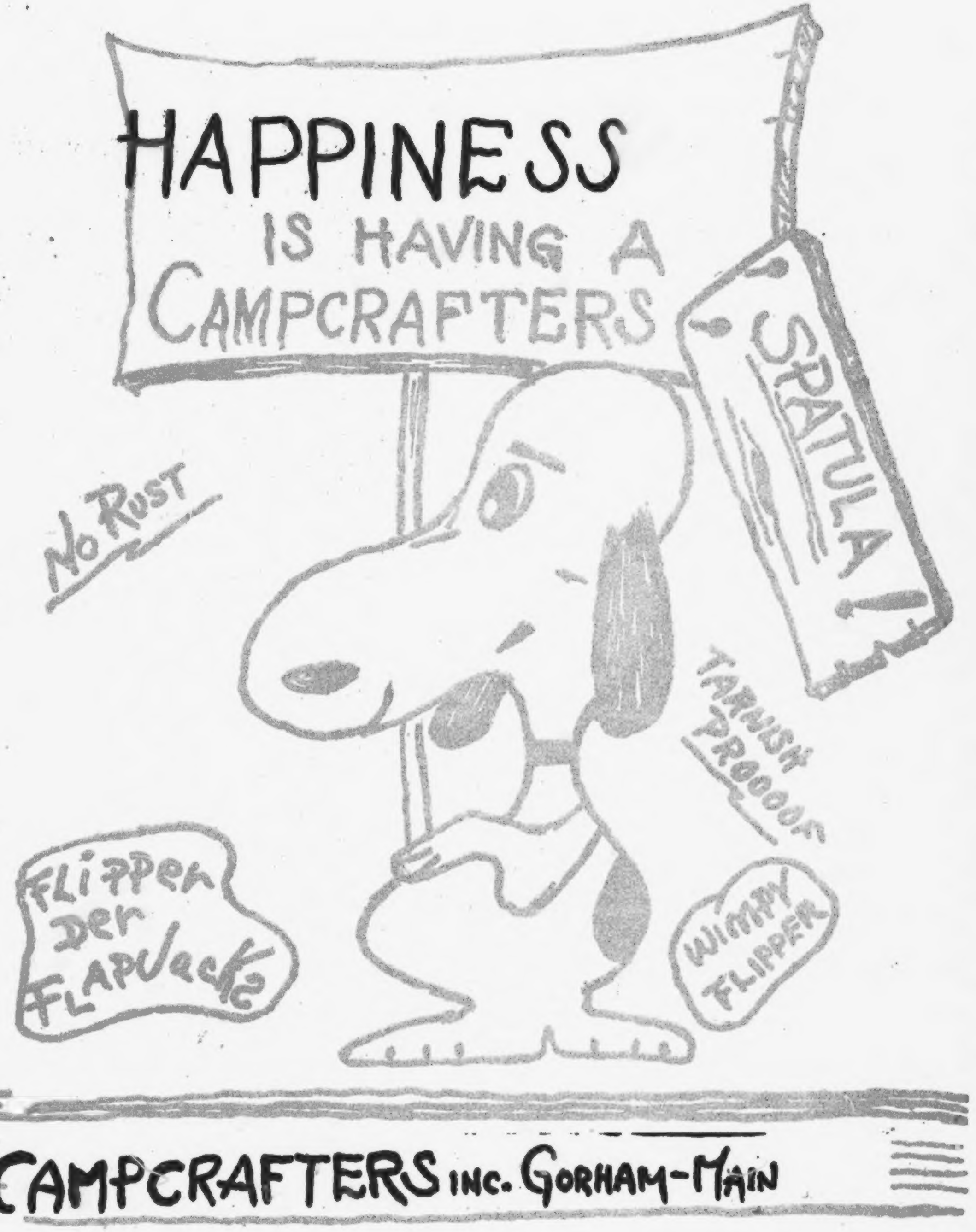
SHAPING

ABOUT READY FOR "QUALITY CONTROL"

ADVERTISING
POSTER

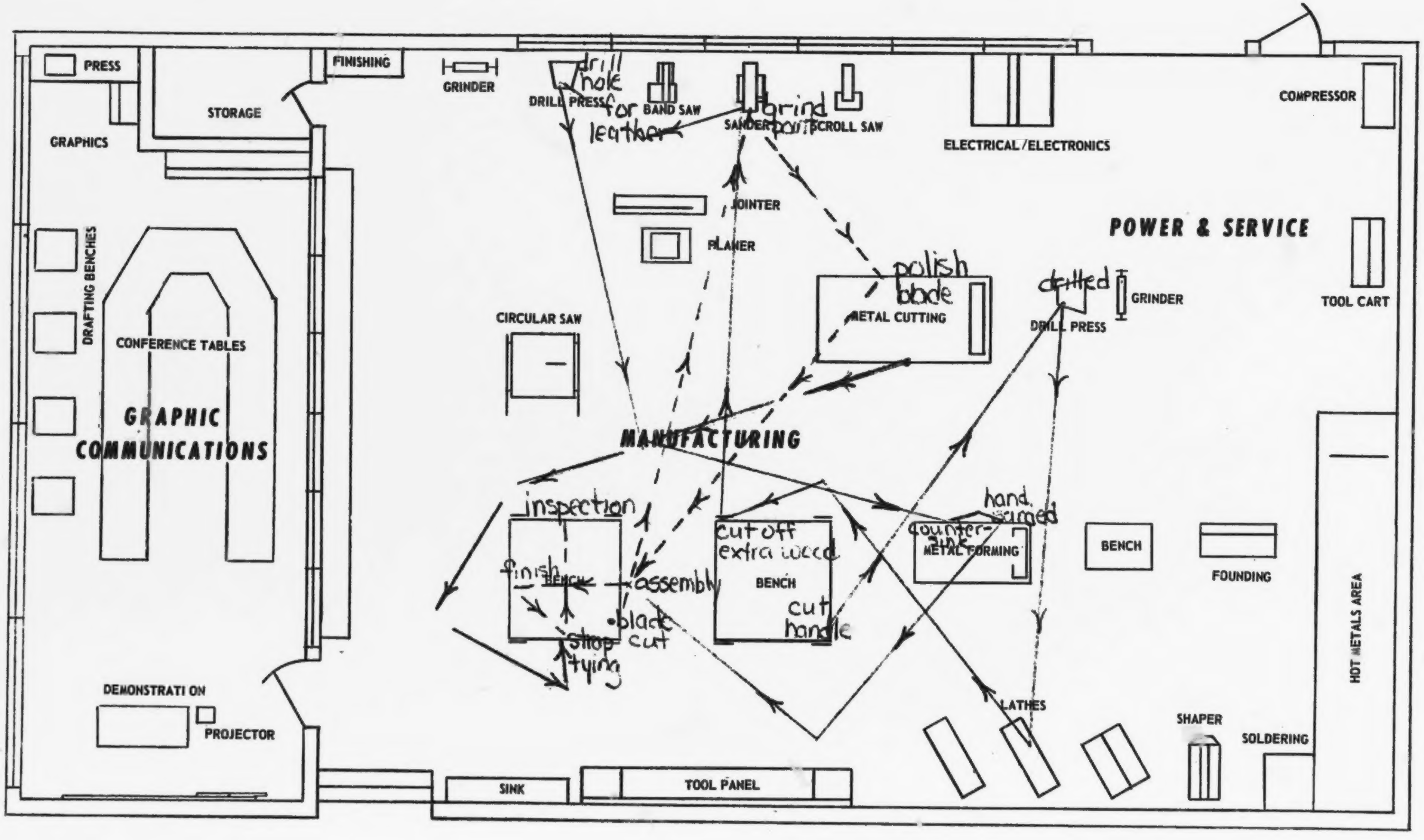
FINISHING
HANDLE


HAPPINESS
IS HAVING A
CAMPCRAFTERS
SPATULA!
NO RUST
TARNISH PROOOOOF
FLIPPER DER FLAPJACKS
WIMPY FLIPPER
CAMPCRAFTERS INC. GORHAM-MAINE


HAPPINESS
IS HAVING A
CAMPCRAFTERS
SPATULA!
NO RUST
TARNISH PROOOOOF
FLIPPER DER FLAPJACKS
WIMPY FLIPPER
CAMPCRAFTERS INC. GORHAM-MAIN

Flow Chart for Skewers

CAMCRAFTERS INC.

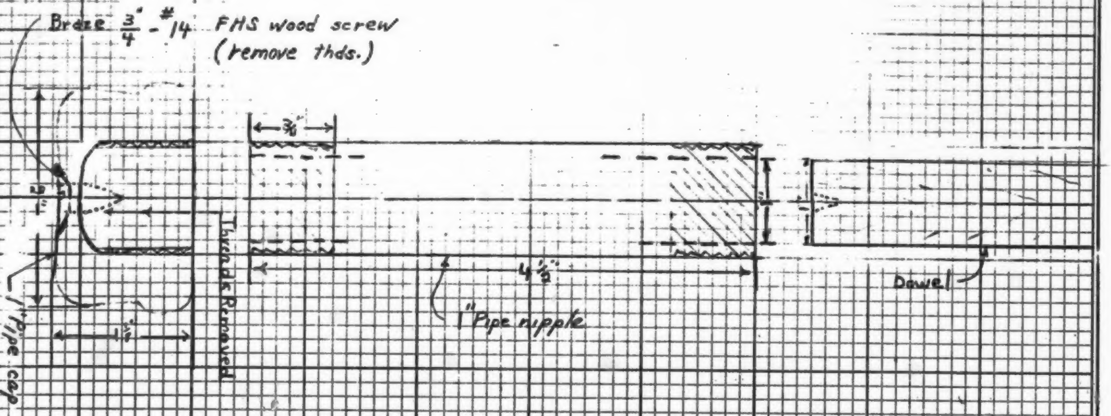

PRESS
GRAPHICS
STORAGE
FINISHING
GRINDER
DRILL PRESS
drill hole for leather
BAND SAW
SANDER
grind point
SCROLL SAW
ELECTRICAL/ELECTRONICS
COMPRESSOR
JOINTER
PLANER
POWER & SERVICE
polish blade
METAL CUTTING
drilled
DRILL PRESS
GRINDER
TOOL CART
CIRCULAR SAW
DRAFTING BENCHES
CONFERENCE TABLES
GRAPHIC COMMUNICATIONS
MANUFACTURING
inspection
finish
BENCH
assembly
•blade cut
strap tying
cut off extra wood
BENCH
cut handle
counter-sink
METAL FORMING
hand sanded
BENCH
FOUNDING
HOT METALS AREA
DEMONSTRATI ON
PROJECTOR
SINK
TOOL PANEL
LATHES
SHAPER
SOLDERING

LABORATORY OF INDUSTRIES
GORHAM STATE COLLEGE

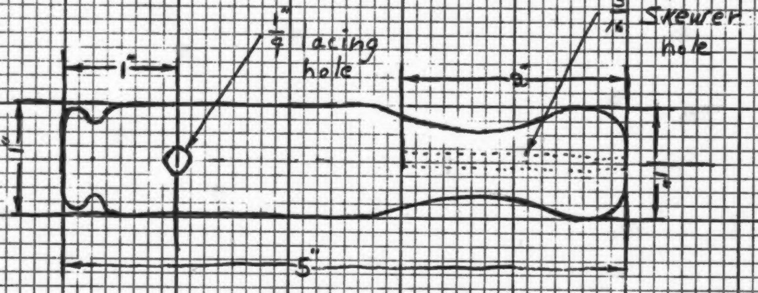
———— = handle
- - - - - - - - = blade
——— ——— = strap
—— - ——— - = assembly, finish, strap tying, & inspection

by Nancy Fiel

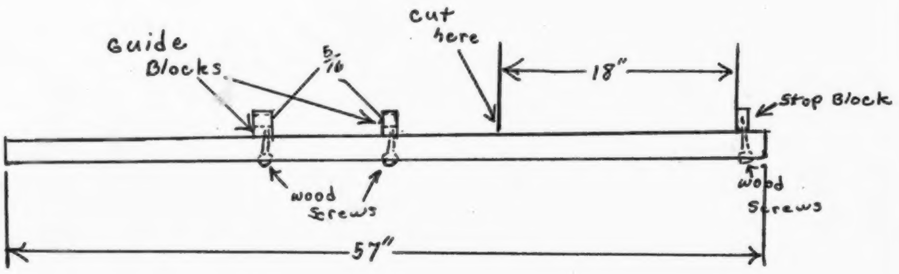
For Correct Use Insert
Dowel-Turn Twice


Breze $\frac{3}{4}$" - #14 FHS wood screw
(remove thds.)
$\frac{3}{8}$"
3/4"
1" Pipe cap
$1\frac{1}{8}$"
Threads Removed
$4\frac{1}{2}$"
1" Pipe nipple
Dowel

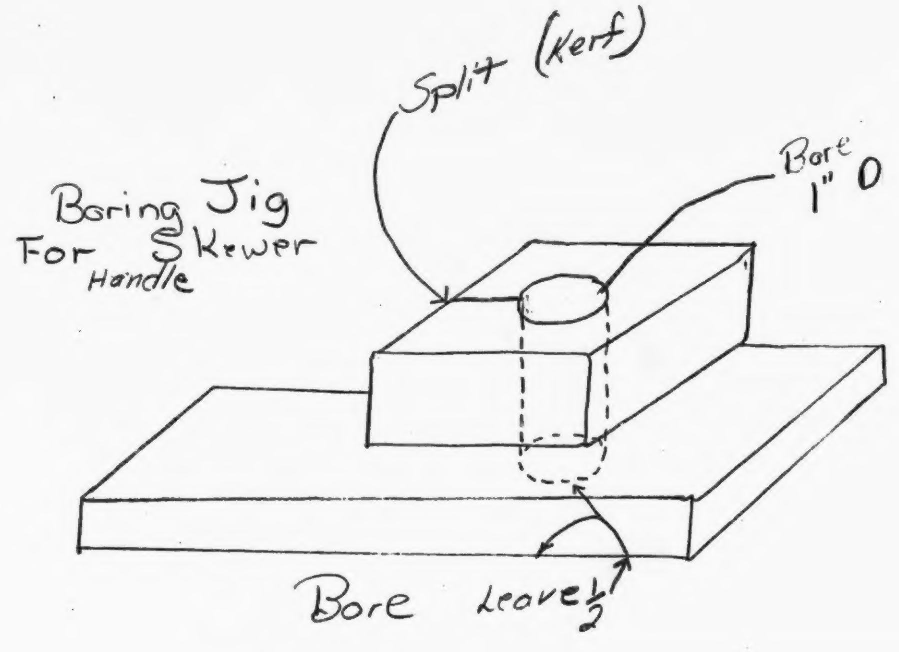
Campcrafters Inc Gorham, Maine	Center Jig Scale: Full	Drawn By: Andrew Dent Checked By: R. Sean


1"
$\frac{1}{4}$" lacing hole
$\frac{3}{16}$" Skewer hole
2"
1"
$\frac{3}{4}$"
5"

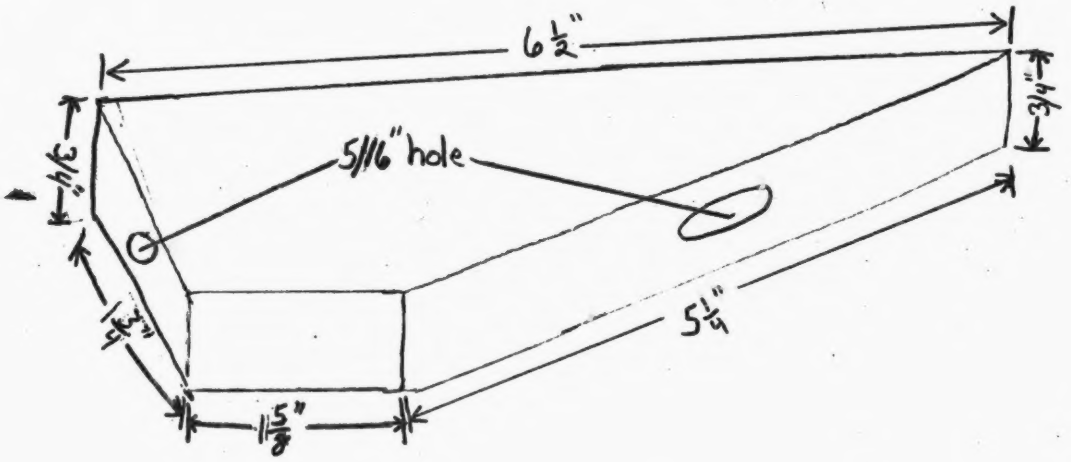
Campcrafters Gorham, Maine	Handle Detail	Drawn By Andrew Dent Checked By


Guide Blocks
$\frac{5}{16}$
cut here
18"
Stop Block
wood Screws
wood Screws
57"

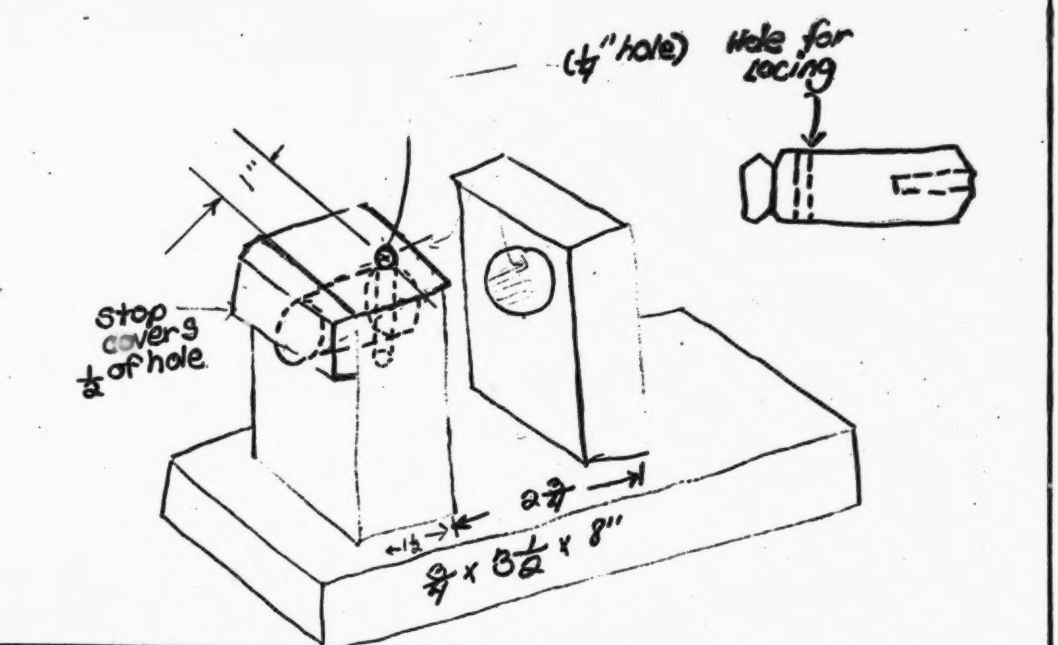
CAMPCRAFTERS GORHAM, MAINE	BLADE JIG	DRAWN BY Joseph K. Ramsdell CHECKED BY


Split (kerf)
Bore 1" D
Boring Jig For Skewer Handle
Bore Leave 1/2

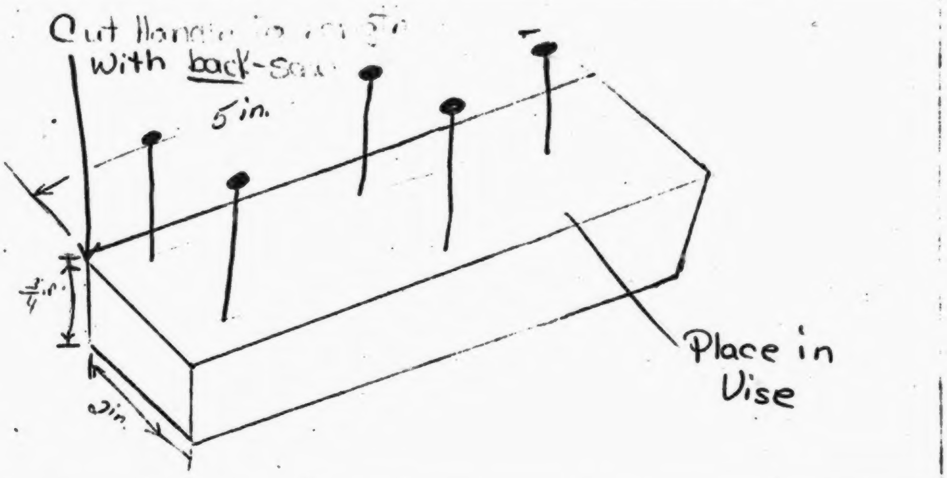
Campcrafters Gorham, Maine	Jig For drilling Skewer Hole in Handle	Drawn By- Eunice Leavitt Checked By-


6 1/2"
3/4"
3/4"
5/16" hole
1 3/4"
5 1/4"
1 5/8"

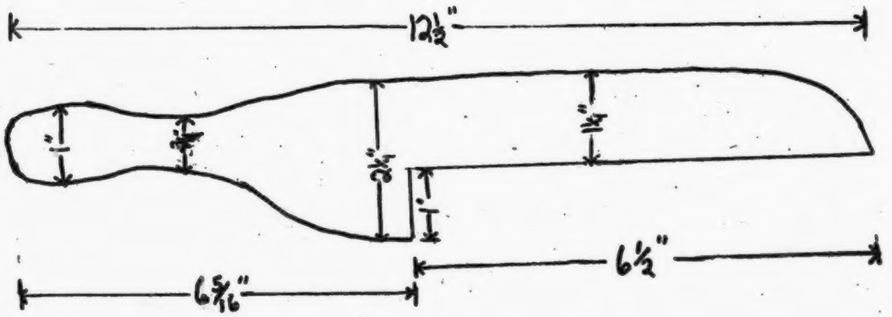
Campcrafters Gorham, Maine	Blade Sharpening Jig	Drawn By Kristene Carpenter


(1/4" hole)
Hole for lacing
1"
Stop covers 1/2 of hole
2 3/4
1 1/2
3/4 x 3 1/2 x 8"

Campcrafters, Inc, Gorham	Drilling Jig Iron Handle	Drawn By Penny Briggs checked by L. Sean

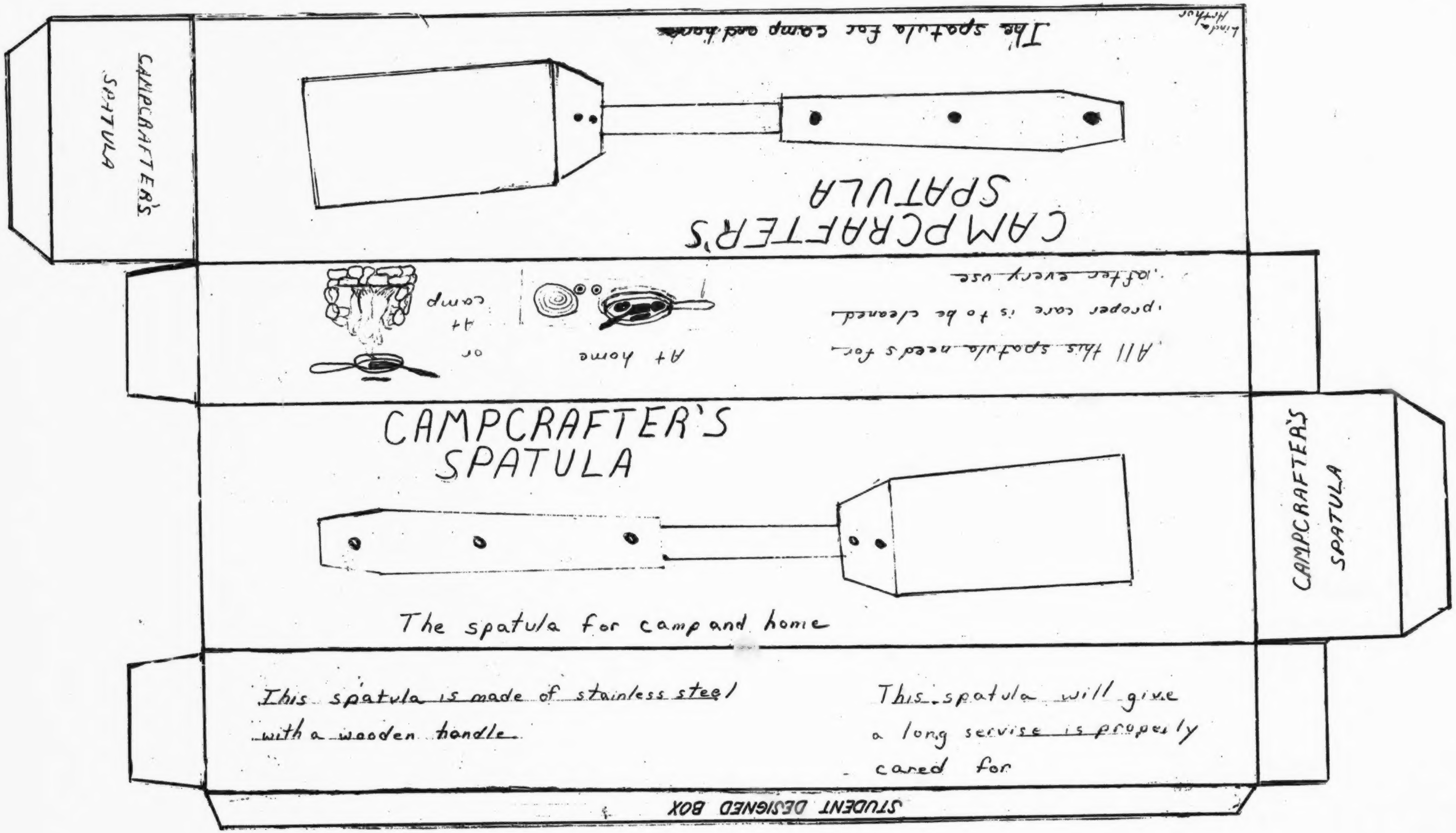

Cut Handle to length
with back-saw
5 in.
3/4 in.
2 in.
Place in Vise

Campcrafters Gorham, Maine	Jig For Cutting Handle to Finish length	Drawn by - Janice Leavitt Checked by - L. Sean


12½"
1"
2 3/8"
1"
6½"
6 5/16"

Made: from ½" white pine

Campcrafters Inc. Gorham, Maine	Jig for cutting Rough handle stock	Drawn By Kristine Carpenter Checked By L. Sean


CAMPCRAFTER'S
SPATULA
CAMPCRAFTER'S
SPATULA
CAMPCRAFTER'S
SPATULA
CAMPCRAFTER'S
SPATULA
At camp
or
At home
Linda Arthur

The spatula for camp and home

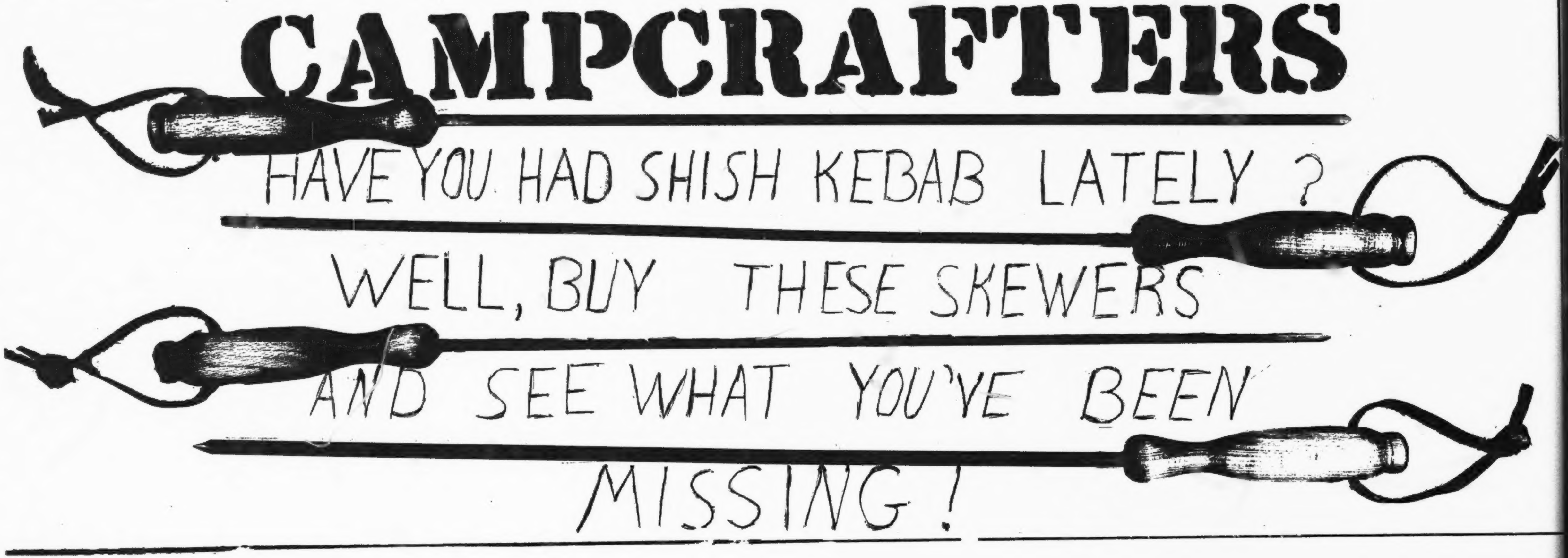
The spatula for camp ~~and home~~

All this spatula needs for proper care is to be cleaned after every use

This spatula is made of stainless steel with a wooden handle

This spatula will give a long servise is properly cared for

STUDENT DESIGNED BOX


CAMPCRAFTERS
HAVE YOU HAD SHISH KEBAB LATELY ?
WELL, BUY THESE SKEWERS
AND SEE WHAT YOU'VE BEEN
MISSING !

TITLE OF UNIT

INTRODUCTION TO TECHNOLOGY AND INDUSTRIAL ARTS

TEACHING TEAM

DANIEL L. BREY
GLEN O. HAYES
RODNEY H. HOFFMAN
RAY O. JONES
WILLIAM E. SMITH

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

Industrial arts has a responsibility to help meet the needs of youth to discover their interests, abilities, limitations, and opportunities in a world challenged by industry and technology, invention and progress.

Technology affects everyone. It is a part of our culture, cannot be separated from everyday life, and an understanding and knowledge of it is essential for all.

SCOPE:

This unit is intended to be used with 8th grade boys and girls that have not had any previous industrial arts experience.

To accomplish the objectives of this unit, it is recommended that no more than two 40 minute class periods be used.

OBJECTIVE 1: To develop an understanding of the meaning and purpose of industrial arts and its relationship to industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize the role of industrial arts in education.	1. Discuss the role of industrial arts in education.	Industrial Arts and its Relationship to Technology
2. Relate the industrial arts program to industry and technology	2. a. Discuss the relation of the industrial arts program to industry and technology. b. Observe closed circuit TV as an example of technology.	

OBJECTIVE 2: To develop desirable attitudes toward the organization and operation of the industrial arts program

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize the course requirements and what is expected of him.	1. a. Discuss course requirements and what is expected of him. b. Fabricate name tags.	Overview of the Industrial Arts Program
2. Recognize what constitutes safe laboratory procedures.	2. Discuss safety procedures.	Organization and Management of the Industrial Arts Laboratory
3. Recall the location and proper care of the common tools, materials and supplies of the laboratory.	3. a. Tour the laboratory. b. Fill in equipment names on laboratory floor plan.	

APPROACH:

1. Introduction of teachers and pupils.
2. Laboratory tour to relate industrial arts tools and equipment to the tools of industry and technology.
3. Pupils will fabricate name tags to create interest.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

American Council on Industrial Arts Teacher Education, *A Historical Perspective of Industry*, American Council on Industrial arts Teacher Education, Bloomington, Illinois: McKnight and McKnight, 1968.

American Vocational Association, *A Guide to Improving Instruction in Industrial Arts*, Washington, D. C.: American Vocational Association, 1953.

Amrine, Harold T.; Ritchey, John A.; Hulley, Oliver S., *Manufacturing Organization and Management*, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966.

Department of Education, *Industrial Arts Technology, A Study of American Industry*, Augusta, Maine: State of Maine Department of Education, Bureau of Vocational Education, 1965.

Groneman, Chris H. and Feirer, John L., *General Shop*, New York: McGraw-Hill Book Company, Inc., 1963.

Olson, Delmar W., *Industrial Arts and Technology*, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963.

State University of New York, Oswego, *Field Study in Industry for the Preparation of Industrial Arts Teachers*, Washington, D. C.: U. S. Department of Health, Education and Welfare, 1967.

RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Pupil information forms
2. Duplicated laboratory layout
3. Film: Technology and You; Audio-Visual Center, Bloomington, Indiana, $1.75 rental
4. Transparencies:

Common Elements of Industry

PUPIL INFORMATION CARD

NAME____ TELEPHONE NO.__________

ADDRESS____ AGE_______

FATHER'S NAME______________________________ OCCUPATION______________

MOTHER'S NAME______________________________ OCCUPATION______________

NUMBER OF BROTHERS AND SISTERS______________________________________

DO YOU PLAN TO GO TO COLLEGE?_______________________________________

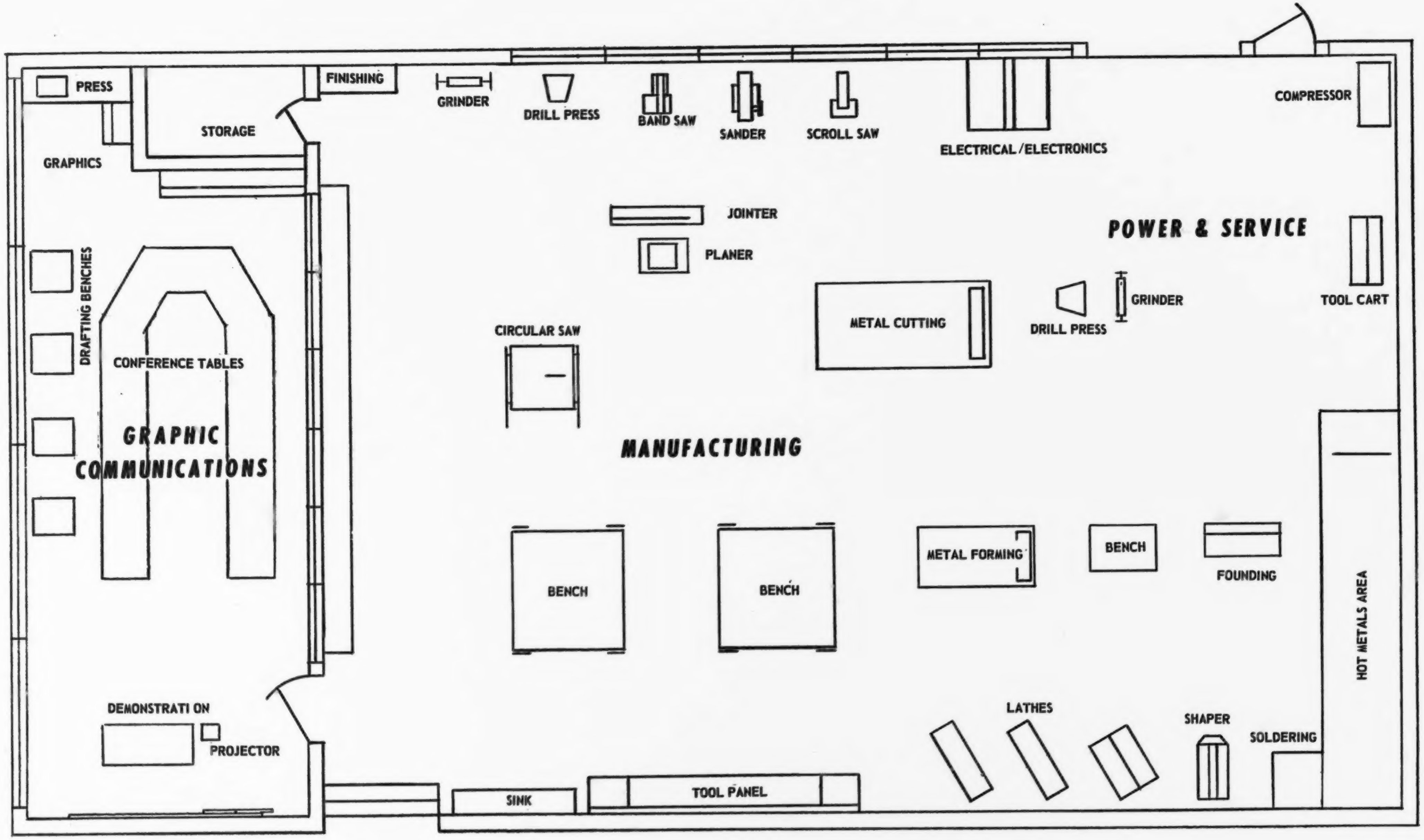
DID YOUR FATHER GO TO COLLEGE?______________________________________

DID YOUR MOTHER GO TO COLLEGE?______________________________________

WHAT HOBBIES DO YOU HAVE?____

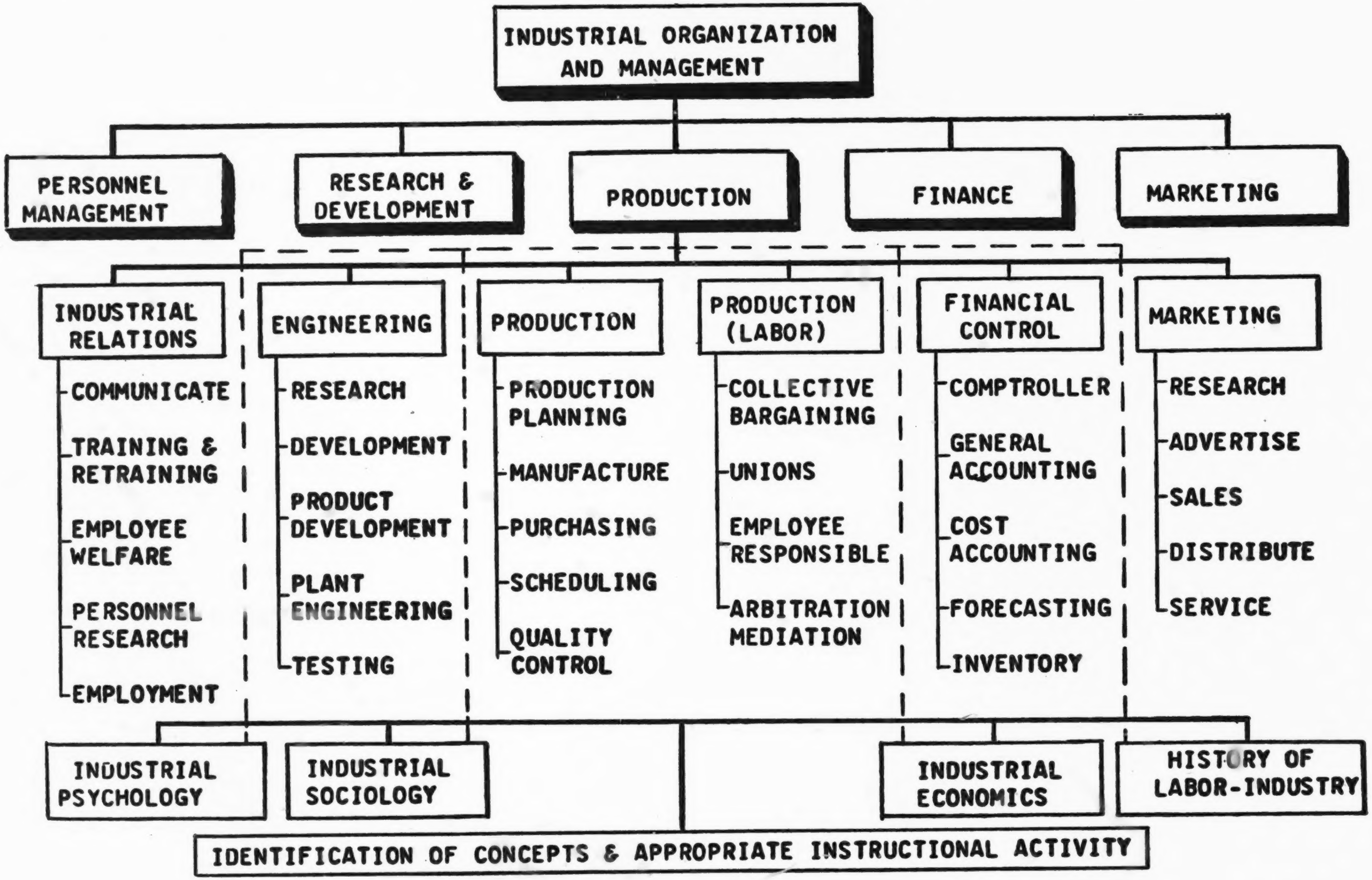
IN CASE OF EMERGENCY, WHO SHOULD BE NOTIFIED?_______________________

WHERE?_______________________


PRESS
STORAGE
FINISHING
GRAPHICS
GRINDER
DRILL PRESS
BAND SAW
SANDER
SCROLL SAW
ELECTRICAL/ELECTRONICS
COMPRESSOR
JOINTER
PLANER
POWER & SERVICE
TOOL CART
DRAFTING BENCHES
CONFERENCE TABLES
CIRCULAR SAW
METAL CUTTING
DRILL PRESS
GRINDER
GRAPHIC COMMUNICATIONS
MANUFACTURING
BENCH
BENCH
METAL FORMING
BENCH
FOUNDING
HOT METALS AREA
DEMONSTRATI ON
PROJECTOR
LATHES
SHAPER
SOLDERING
SINK
TOOL PANEL

LABORATORY OF INDUSTRIES
GORHAM STATE COLLEGE

COMMON ELEMENTS OF INDUSTRY


INDUSTRIAL ORGANIZATION AND MANAGEMENT
PERSONNEL MANAGEMENT
RESEARCH & DEVELOPMENT
PRODUCTION
FINANCE
MARKETING
INDUSTRIAL RELATIONS
COMMUNICATE
TRAINING & RETRAINING
EMPLOYEE WELFARE
PERSONNEL RESEARCH
EMPLOYMENT
ENGINEERING
RESEARCH
DEVELOPMENT
PRODUCT DEVELOPMENT
PLANT ENGINEERING
TESTING
PRODUCTION
PRODUCTION PLANNING
MANUFACTURE
PURCHASING
SCHEDULING
QUALITY CONTROL
PRODUCTION (LABOR)
COLLECTIVE BARGAINING
UNIONS
EMPLOYEE RESPONSIBLE
ARBITRATION MEDIATION
FINANCIAL CONTROL
COMPTROLLER
GENERAL ACCOUNTING
COST ACCOUNTING
FORECASTING
INVENTORY
MARKETING
RESEARCH
ADVERTISE
SALES
DISTRIBUTE
SERVICE
INDUSTRIAL PSYCHOLOGY
INDUSTRIAL SOCIOLOGY
INDUSTRIAL ECONOMICS
HISTORY OF LABOR-INDUSTRY
IDENTIFICATION OF CONCEPTS & APPROPRIATE INSTRUCTIONAL ACTIVITY

State University of New York, Oswego, Field Study in Industry-----,p. C-38.

TOOLS AND EQUIPMENT:

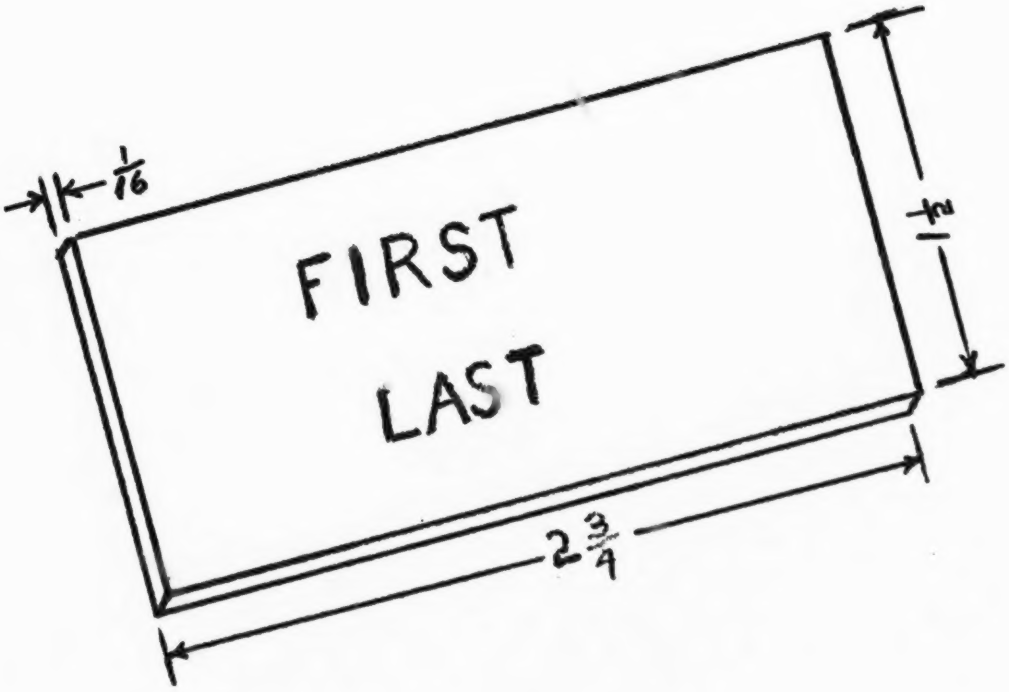
No special tools other than those common to the comprehensive general laboratory will be necessary to meet the objectives of this unit, including:

1. Overhead projector
2. Projectural screen

MATERIALS AND SUPPLIES:

1. Pencils
2. Aprons
3. Engraved phenolic strips
4. Pin backs
5. Household cement

PUPIL NAMETAGS


1/16
FIRST
LAST
1 1/2
2 3/4

NOTE:

Pin clip fastened onto back with

jewelry finding cement

LESSONS TO BE TAUGHT:

Industrial Arts and its Relationship to Technology

An Overview of the Industrial Arts Program

Organization and Management of the Industrial Arts Laboratory

Title: Industrial Arts and Its Relationship to Technology

Presentation:

I. Industry: its importance

II. Industrial arts: a study of industry

A. History

1. Meaning of the term industrial arts
2. The manual training movement
3. The progressive education movement

B. Objectives, goals and purposes of industrial arts

1. Understanding industry
2. Skills
   a. Design
   b. Use of materials
   c. Use of tools
   d. Planning
   e. Cooperation
3. Attitudes
   a. Appreciation for accomplishment or achievement
   b. The importance of the worker in our society
   c. Appreciation for and understanding of industry and the part it plays in our culture

C. Purpose of industrial arts

1. Vocational
2. General educational
3. Health
4. Economical
5. Esthetic
6. Social

D. Relating industrial arts to industry

1. Laboratory - machines of industry
2. Involved in making things
3. Organization - student personnel system and how it relates to industry
4. Excursions - visits to industry
5. Intensive study of a particular industry - household accessories

REFERENCES:

American Council on Industrial Arts Teacher Education, *A Historical Perspective of Industry*, Chapter 1.

American Vocational Association, *A Guide to Improving Instruction in Industrial Arts*, Chapter 1.

Department of Education, State of Maine, *Industrial Arts Technology, A Study of American Industry*, pp. 1-5.

Delmar W. Olson, *Industrial Arts and Technology*, pp. 1-28, 31-60, 161-190.

Title: An Overview of the Industrial Arts Program

Presentation:

I. Class Introductory Material

A. Introduction of teachers to students

1. Who you are
2. Where you are from

B. Introduction of students to teachers and each other

C. Get information from students concerning what an employer should know

D. Complete student information cards

E. Students complete name tags to interest them in laboratory experiences

II. Industrial Arts Laboratory Procedures

A. Procedure on entering laboratory

1. Enter classroom
2. Seating assignments, if necessary
3. Presentation of lesson, if scheduled

B. Procedure on leaving the laboratory

1. Laboratory clean-up during final 10 minutes
2. Return to classroom
3. Dismissal when all is in order

References: None necessary

Title: Organization and Management of the Industrial Arts Laboratory

Presentation:

I. Safety

A. Industrial safety programs

1. Human costs
2. Medical costs
3. Compensation
4. Insurance costs
5. Lost production

B. Industrial arts laboratory safety

1. No horse play
2. Get permission before operating machines
3. Report accidents immediately
4. Wear proper clothing and eye protection
5. Return tools immediately
6. Be alert while using tools and machines

II. Laboratory tour

A. Introduction to the manufacturing panel

1. Tools they have at home
2. Common hand tools
   a. uses
   b. names
3. Tools of one type are grouped together
   a. Cutting tools
   b. Layout tools
   c. Shaping and forming tools
   d. Holding tools
   e. Assembly tools
   f. Drilling and boring tools

B. Machines and equipment the students will be permitted to use

1. Drill press
2. Box and pan brake
3. Forming rolls
4. Grinder
5. Scroll saw
6. Squaring shears

C. Other machines and equipment or areas

1. Circular saw
2. Jointer
3. Surface planer
4. Wood lathe
5. Engine lathe
6. Metal shaper
7. Hot metals area
8. Electricity area
9. Power and transportation area
10. Store room

D. Safety in the laboratory

1. Placement of machines
    a. Metals equipment placement
    b. Woods equipment placement
    c. Safety lanes
2. Eye safety
    a. All cutting machines require eye protection
    b. Protection around the arc welding area

References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley, *Manufacturing Organization and Management*, p. 353

Chris H. Groneman and John L. Feirer, *General Shop*, pp. 67, 192

UNIT EVALUATION:

Observe pupils as they work to determine if behavior has been affected.

TITLE OF UNIT

HOUSEHOLD ACCESSORIES INDUSTRIES

TEACHING TEAM

DANIEL L. BREY
GLEN O. HAYES
RODNEY H. HOFFMAN
RAY O. JONES
WILLIAM E. SMITH

NDEA INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
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July 1 - August 9, 1968

INTRODUCTION:

Industry - the instrument of society for the application of technology, has a continual effect on all individuals. Most of us take for granted the many household accessories which we encounter each day and which make our lives more convenient and comfortable.

With many millions of men and women gainfully employed by industries producing household accessories and since the importance of these products is easily recognized by beginning pupils who are generally familiar with them, this seems an appropriate area in which to begin a study of the manufacturing industries.

This unit, then, will bring into closer focus the role of these industries in our society and the many functions which are necessary for their success.

SCOPE:

This unit is intended to be used as a second teaching unit with boys and girls who have been introduced to the industrial arts program.

To accomplish the objectives of this unit, it is suggested that 9 weeks, or 24 hours, be alloted to adequately cover the information and experiences presented in or through this unit.

Activities and products shall be characteristic of the household accessories industries and will be limited to fabrication from sheet materials. Special emphasis will be placed upon the partnership type of ownership and the functions involved.

OBJECTIVE 1: To develop an understanding of an insight to the household accessories industries and their place in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupil will be able to:	Have pupils:	
1. Identify local industries which manufacture household accessories and recognize the effect of these on employment and the economy.	1. a. List several local household accessories industries b. Tour a local household accessories industry. c. Look through the yellow pages for names of household accessories industries. d. Look through local buyers guides for names of household accessories industries e. Look through catalogs for examples of products which are produced by household accessories industries.	Local Household Accessories Industries and their Effect on Employment and the Economy

OJBECTIVE 1: To develop an understanding of an insight to the household accessories industries and their place in our society (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils: f. Visit local stores and identify manufactured household accessories. g. Discuss how money circulates through the economy h. Discuss how business uses its money. i. List raw materials, labor and markets needed for local household accessories industries.	
2. List the types of jobs or employment opportunities in the household accessories industries	2. a. List the father's occupation b. Check through the local want ads for job classifications c. Tell what job he would like to do	Industrial Organization and Laboratory Personnel

OJBECTIVE 1: To develop an understanding of an insight to the household accessories industries and their place in our society (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	d. Select a job in the personnel organization	
	e. Compare shop organization personnel with that of industry	
3. Explain the differences in types of ownership	3. a. List types of ownership and differences in organization of the industries	Types of Ownership
	b. Establish themselves in teams as partners in business	
	c. Examine telephone or other business directory and list three or more companies that fall into the partnership category	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Apply principles of design to products of these industries	1. a. Look through appropriate catalogs for designs presently in use	Principles of Good Design
	b. Identify design principles in sample accessories	
2. Follow logical procedure in selecting a product	2. a. Look through appropriate catalogs for product ideas	Procedure in Selecting a Product
	b. Compare possible products	
	c. Use criteria for production and marketing	
3. Make working sketches or drawings of selected product	3. a. Sketch the proposed product	Working Drawings and/or Sketches of Selected Products
	b. Examine industrial sketches or drawings for content	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
4. Analyze drawings or sketches for materials needed	4. a. Complete a bill of materials	Selection of Materials
	b. Compare stock list used in industry with their own	
5. Analyze drawings or sketches for procedures and/or construction details	5. a. Construct procedure list for individual product	Procedures and/or Construction Details
6. Recognize and/or obtain the materials selected	6. a. Select materials for individual product	Obtaining and Recognizing Materials
	b. Compare all sheet materials found in laboratory	
7. Recognize and use simple layout tools	7. a. Locate layout tools in laboratory	Simple Layout Tools and Procedures
	b. List simple layout tools	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	c. Use simple layout tools on selected products	
	d. Demonstrate use of layout tools to classmates	
	e. Prepare a report on history of layout tools	
	f. Prepare a list of layout tools found in home workshop	
8. Recognize and use simple cutting tools and procedures	8. a. Locate cutting tools in laboratory	Simple Cutting Tools and Procedures
	b. List simple cutting tools	
	c. Use simple cutting tools on selected product	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupil:	
	d. Investigate local suppliers of cutting tools	
	e. Prepare a price list of those cutting tools required in a home workshop	
9. Recognize and use simple forming and shaping tools and procedures	9. a. Locate forming and shaping tools in laboratory	Simple Forming and Shaping Tools and Procedures
	b. List simple forming and shaping tools in laboratory	
	c. Use simple forming and shaping tools on selected product	
	d. View demonstration of forming and shaping tools on closed circuit TV	

OBJECTIVE 2: To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	9. e. Discuss with classmates types of tools and equipment used to form and shape materials	
10. Recognize and use simple holding tools and procedures	10. a. Locate holding tools in laboratory	Simple Holding Tools and Procedures
	b. Use simple holding tools on selected product	
	c. Prepare a list of holding tools from a mail order catalog	
11. Recognize and use simple assembly tools and procedures	11. a. Locate assembly tools on manufacturing panel	Simple Assembly Tools and Procedures
	b. List simple assembly tools	
	c. Use simple assembly tools on selected product	

OBJECTIVE 2: To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	11. d. Conduct experiment on strength of fasteners	
	e. Prepare a report on kinds and types of assembly materials	
12. Recognize and use simple finishing equipment and procedures	12. a. Locate finishing materials in laboratory	Finishing Methods and Procedures
	b. Prepare a list of common finishes for sheet material	
	c. Use simple finishing materials and techniques on selected product	
	d. View film on finishing	
	e. Complete questionnaire on film on finishing	

OBJECTIVE 2: To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
13. Inspect product and use testing procedures	13. a. Evaluate own product	Quality Control Procedures and Inspection
	b. Compare industrial inspection techniques and relate to own product	
	c. Prepare an inspection form for use in laboratory	
14. Recognize packaging, labeling and distribution procedures	14. a. Package and label his product	Marketing Procedures
	b. Display typical packaging materials from industry	
	c. Visit local gift shop and observe packaging and labeling	

OBJECTIVE 2: To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	14. d. Discuss procedures used to get product to distribution centers or terminals	
15. Use pricing techniques to determine sale value of product	15. a. Determine the material costs of his product b. Estimate hours needed to produce product c. Estimate selling price of product d. Compare selling price with similar industry-produced products e. Develop cost pricing charts for laboratory use.	(Included in Above)

OBJECTIVE 3: To develop desirable attitudes and respect for work, the worker, and for the products of the household accessories industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupil will be able to:	Have pupils:	
1. Work cooperatively with members of his class	1. a. Participate in the personnel organization	Industrial Organization and Laboratory Personnel System
	b. Assist others in their tasks	
	c. Follow policies for laboratory operation	
2. Care for tools, equipment and facilities	2. a. Return tools to panel when finished with them	(Include in each lesson when applicable)
	b. Clean up work area	
	c. Participate in personnel organization	
3. Observe safety standards, posters, signs, and regulations	3. a. Prepare items for a safety bulletin board	Safety in Industry and the Industrial Arts Laboratory
	b. Observe a safety film	
	c. Observe safety signs on machines	
	d. Wear proper safety clothing and use safety devices	

APPROACH:

1. Discuss with pupils what household accessories are.
2. Display some household scenes showing accessories.
3. Visit a store that sells household accessories and identify manufactured products.
4. Show various materials and discuss how industry uses these to design and produce household accessories.
5. Visit a local industry which manufactures household accessories.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T.; Ritchey, John A.; Hulley, Oliver S., *Manufacturing: Organization and Management*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1966.

Feirer, John L., *Advanced Woodwork and Furniture Making*, Peoria, Illinois: Charles A. Bennett Publishers, 1954.

Feirer, John, *Woodworking for Industry*, Peoria, Illinois: Charles A. Bennett Company, Inc., 1965.

Feirer, John and Lindbeck, John, *Industrial Arts Metalwork*, Peoria, Illinois: Charles A. Bennett Company, Inc., 1965.

Fryklund, Verne C., General Shop Woodworking, Bloomington, Illinois: McKnight and McKnight, 1963.

George, Claude S., Jr., *Management in Industry*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

Gerbracht, Carl and Robinson, Frank E., *Understanding America's Industries*, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1962.

Gibia, S. W., *Wood Finishing and Refinishing*, Princeton, N. J.: D. Van Nostrand Publishers, 1954.

Groneman, Chris H., *General Woodworking*, New York: McGraw-Hill Book Company, Inc., 1959.

Groneman, Chris H. and Feirer, John L., *General Shop*, New York: McGraw-Hill Book Company, Inc., 1963.

Hjorth, Herman, *Basic Woodworking Processes*, Milwaukee, Wisconsin: Bruce Publishing Company, 1961.

Madden, Ira C., *Woodworking for Industrial Arts*, Chicago: Goodheart-Willcox Company, Inc., 1959.

Newell, Adnah Clifton and William F. Holtrop, *Coloring and Painting Wood*, Peoria, Illinois: Charles A. Bennett Company, Inc., 1961.

Schaaff, Robert, *Complete Book of Wood Finishing*, New York: McGraw-Hill Book Company, Inc., 1956.

State University of New York, Oswego, *Field Study in Industry for the Preparation of Industrial Arts Teachers*.

Wagner, Willis H., Woodworking, Chicago, Illinois: Goodheart Willcox Company, Inc., 1961.

A. REFERENCE AND RESEARCH MATERIALS (Continued):

Waring, Ralph G., Modern Wood Finishing, Milwaukee: Bruce Publishing Company, 1963.

B. TEACHING AIDS AND DEVICES

Chalkboard and chalk

Catalog pictures of household accessories

Samples of household accessories

Sample packages for household accessories

Samples of materials available for pupil use

Film, Wood Finishing, 16 mm, sound film, McGraw-Hill Book Company, 330 West 42nd Street, New York, New York 10030

Book rack sketch

Dollar bill sample (sales)

Film questions

Transparencies

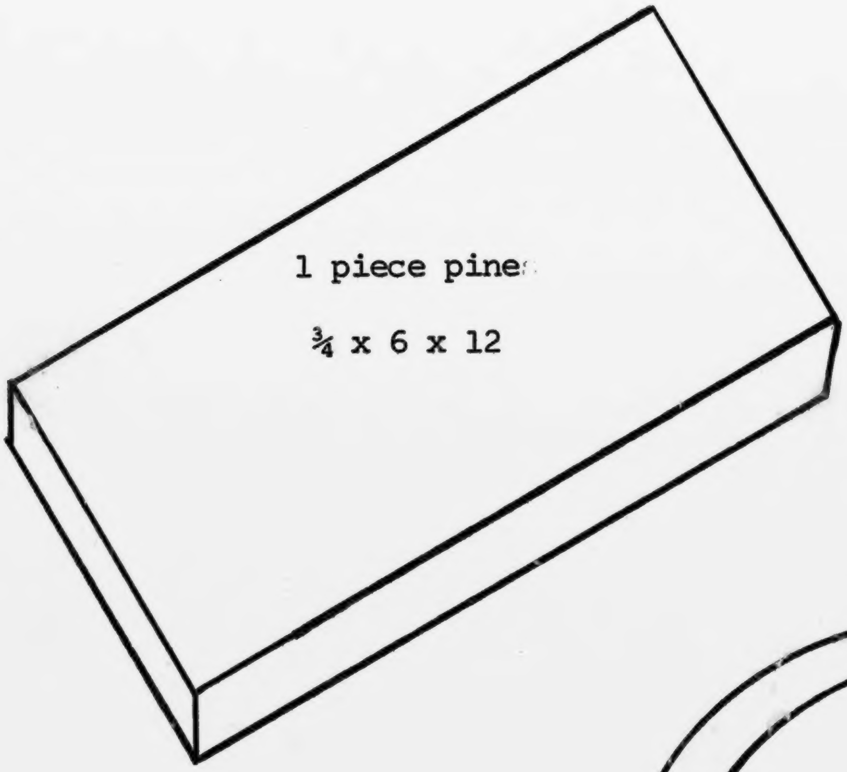
- Manufacturing -- factors for success
- Business ownership and control
- Sole proprietorship
- Partnership
- Business corporation
- Formation of corporations
- Management of corporation
- Levels of flow of authority
- Functions of industrial relations
- Application blank for factory workers
- Selection and employment procedure
- Typical path of a research project
- Three groupings of engineering functions
- Research and development
- Derivation of basic cost elements
- Cost analysis and process chart
- Flow process chart
- Scheduling of a job order
- Typical standard route chart
- Typical job ticket
- How production control in the Ford Motor Company relates to other activities
- Development of the total cost of a product
- Industrial Arts Product Evaluation Sheet
- Control procedures

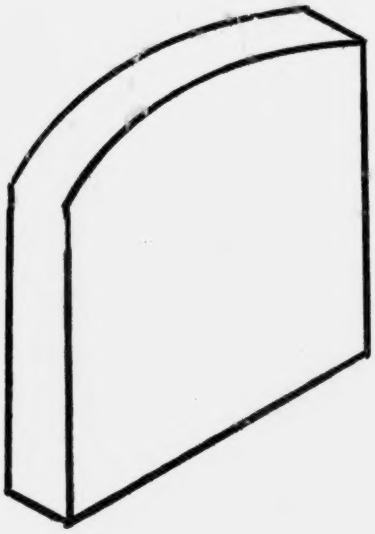
Employee appraisal
Grievance form [illegible]
Marketing functions
Stock certificate
Marketing sub-functions
Components of cost
Relation of cost to profit
Total cost and selling price of a product
Functions of financial control
How to read financial page of a newspaper

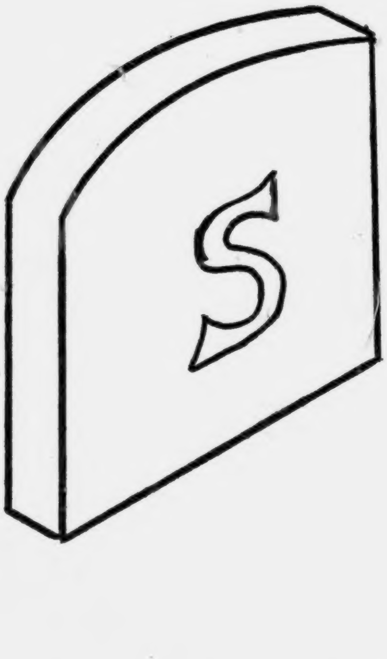
BOOK RACK

Idea developed through lessons:

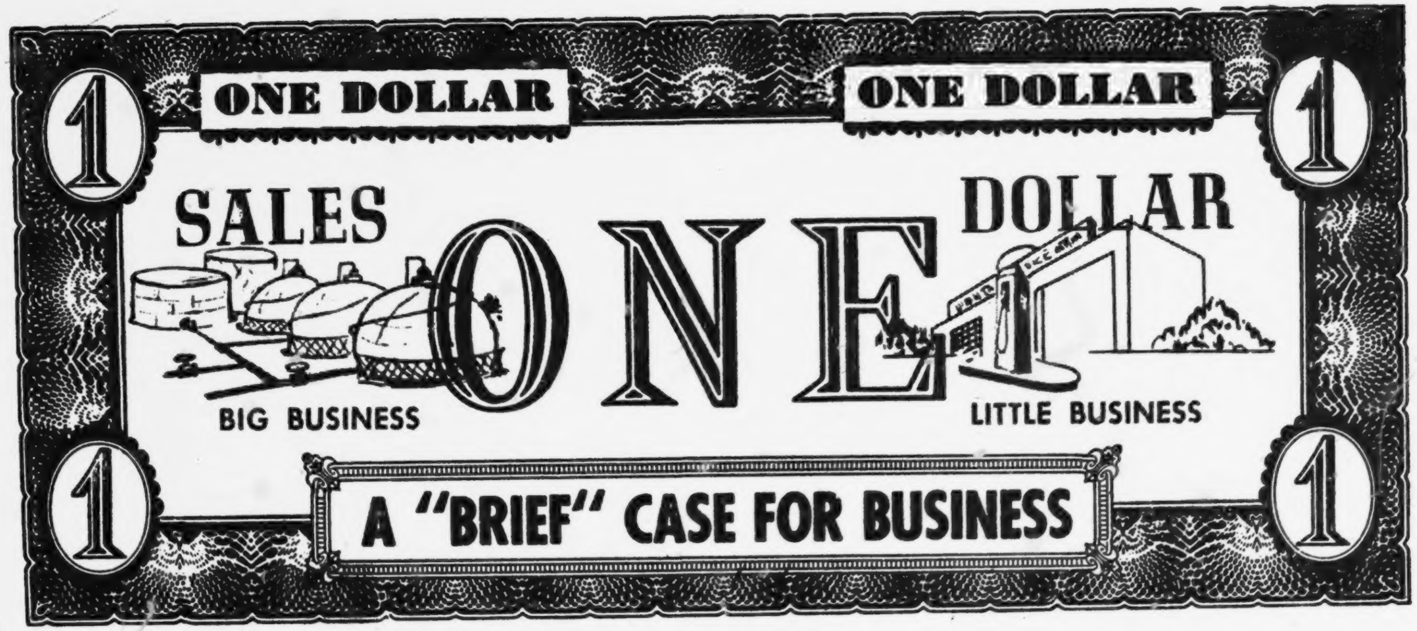
- Procedure in Selecting a Product
- Principles of Good Design
- Making Working Drawings and/or Sketches of Selected Projects

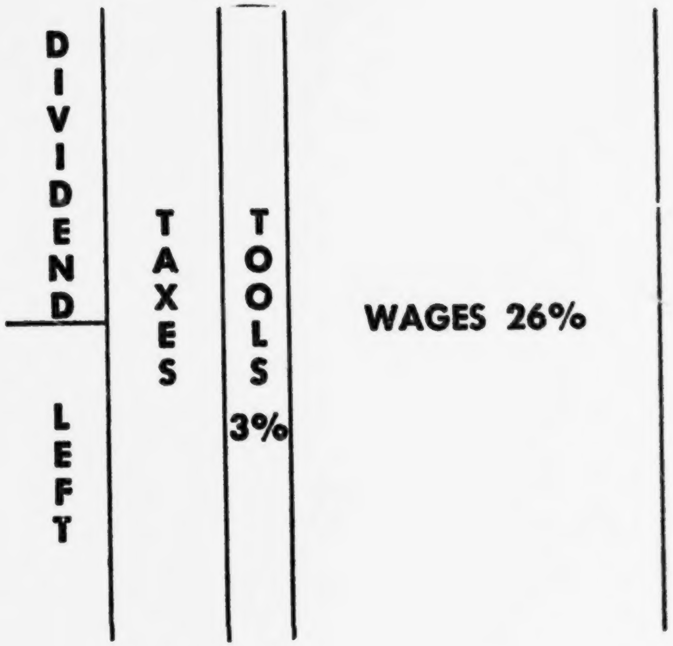






2 ends ¾ x 5 x 6
pine, 1 plain,
1 with initial


ONE DOLLAR
ONE DOLLAR
1
1
1
1
SALES
ONE
DOLLAR
BIG BUSINESS
LITTLE BUSINESS
A "BRIEF" CASE FOR BUSINESS


DIVIDEND
LEFT
TAXES
TOOLS 3%
WAGES 26%
SUPPLIES 58%

FILM QUESTIONS:

Answer the following from the film:

1. Tell how to seal in rosin.
2. The best finish to show natural grain is ________.
3. Three kinds of stain are ______, ________ and _________.
4. Why is it necessary to test stains first?
5. How should the end grain be treated?
6. What should be stained first?
7. What direction should you apply the stain?
8. Hardwoods or close grain woods should be sealed with ______.

MANUFACTURING - FACTORS FOR SUCCESS

MONEY: A PREREQUISITE TO A MANUFACTURING OPERATION. NECESSARY TO PROVIDE THE PLANT AND EQUIPMENT, TO PURCHASE RAW MATERIALS, AND TO MEET PAYROLLS UNTIL SUCH A TIME THAT THERE IS INCOME FROM THE SALE OF PRODUCTS.

MACHINES: INCLUDES ALL PRODUCTION FACILITIES SUCH AS BUILDINGS, TOOLS, EQUIPMENT, AS WELL AS MACHINES IN THE STRICT SENSE. THESE ARE THE TOOLS OF PRODUCTION.

MATERIALS: THOSE THINGS THAT BECOME A PART OF THE FINISHED PRODUCT OFFERED FOR SALE OR THAT ARE USED IN THE MANUFACTURE OF THAT PRODUCT.

MEN: THOSE PEOPLE IN THE MANUFACTURING CONCERN WHO USE THE MACHINES AND MATERIALS PROVIDED TO MAKE THE PRODUCT.

METHODS: INTEGRATORS OF MACHINES, MATERIALS, AND MEN.

MARKETS: THE MEANS BY WHICH A COMPANY SECURES INCOME, NOT ONLY TO PAY FOR THE COST OF THE FACTORS DESCRIBED SO FAR, BUT ALSO TO PROVIDE A PROFIT.

MANAGEMENT: THE FUNCTION OF PLANNING, ORGANIZING, DIRECTING, AND CONTROLLING.

AMRINE AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 3 - 5.

BUSINESS OWNERSHIP AND CONTROL

5 BASIC FORMS

3 HAVE PROFIT MOTIVE AND RUN FREELY
1 IS NON-PROFIT AND OPERATES FREELY
1 IS GOVERNMENT OPERATED, NON-PROFIT

THOSE THAT OPERATE FOR A PROFIT ARE THE:

A. SOLE PROPRIETORSHIP

B. PARTNERSHIP

C. BUSINESS CORPORATION

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-69.

SOLE PROPRIETORSHIP

ADVANTAGES:

1. EASY TO FORM
2. EASY TO DISSOLVE
3. CONTROL AND DECISIONS BY INDIVIDUAL
4. ALL PROFITS TO OWNER
5. TAX BENEFITS OVER CORPORATION

DISADVANTAGES:

1. DIFFICULT TO ENLARGE - NOT ENOUGH CAPITAL
2. CREDITORS CAN ATTACH PERSONAL PROPERTY
3. MUST RELY ON OWN SKILL AND ABILITY
4. BUSINESS DIES AT DEATH OF OWNER

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-70.

PARTNERSHIP

ADVANTAGES:

1. GREATER CAPITAL
2. MORE BORROWING POWER
3. COMBINATIONS OF TALENT WITH SIMILAR INCENTIVES
4. SOME TAX ADVANTAGES OVER CORPORATION

DISADVANTAGES:

1. CREDITORS CAN ATTACH PERSONAL PROPERTY OF ANY PARTNER
2. CAN'T WILL RIGHTS WITHOUT CONSENT OF ALL CONCERNED
3. DISAGREEMENT EASY BETWEEN PARTNERS
4. DEATH OF THE FIRM WHEN ANY PARTNER DIES

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-71.

THE BUSINESS CORPORATION

THE BUSINESS CORPORATION IS AN ARTIFICIAL BEING, INVISIBLE, INTANGIBLE, AND EXISTING ONLY IN THE EYES OF THE LAW. THE CORPORATION POSSESSES THE POWERS TO:

1. OWN PROPERTY
2. ENTER INTO CONTRACT
3. TO SUE
4. TO BE SUED

FORMATION OF CORPORATIONS

1. GENERALLY A MINIMUM OF THREE PEOPLE

2. THEY APPLY TO THE STATE IN WHICH THEY WILL DO BUSINESS. THE APPLICATION WILL GENERALLY CONTAIN THE FOLLOWING:

   A. NAMES OF BOARD OF DIRECTORS
   B. OBJECTIVES
   C. MAXIMUM NUMBER OF SHARES OF CAPITAL STOCK
   D. CLASSES OF STOCK
   E. VALUE OF THE STOCK
   F. METHODS OF STOCK TRANSFER
   G. PRINCIPAL PLAN OF THE BUSINESS
   H. POWER, RIGHTS AND PRIVILEGES OF THE STOCKHOLDERS

NOTE:
THE ACTUAL REQUIREMENTS WILL VARY FROM STATE TO STATE.

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-73.

MANAGEMENT OF CORPORATION

THE CORPORATION IS OWNED BY THE STOCKHOLDERS BUT MANAGED BY THE BOARD OF DIRECTORS WHO ARE ELECTED BY THE STOCKHOLDERS.

OWNERSHIP OF THE CORPORATION

STOCKHOLDERS OWN THE CORPORATION, BUT THEY SHARE IN THE PROFITS ONLY AFTER ALL PRIOR LIENS HAVE BEEN MET.

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-74.

LEVELS AND FLOW OF AUTHORITY

Ultimate authority and control

Policy Formation

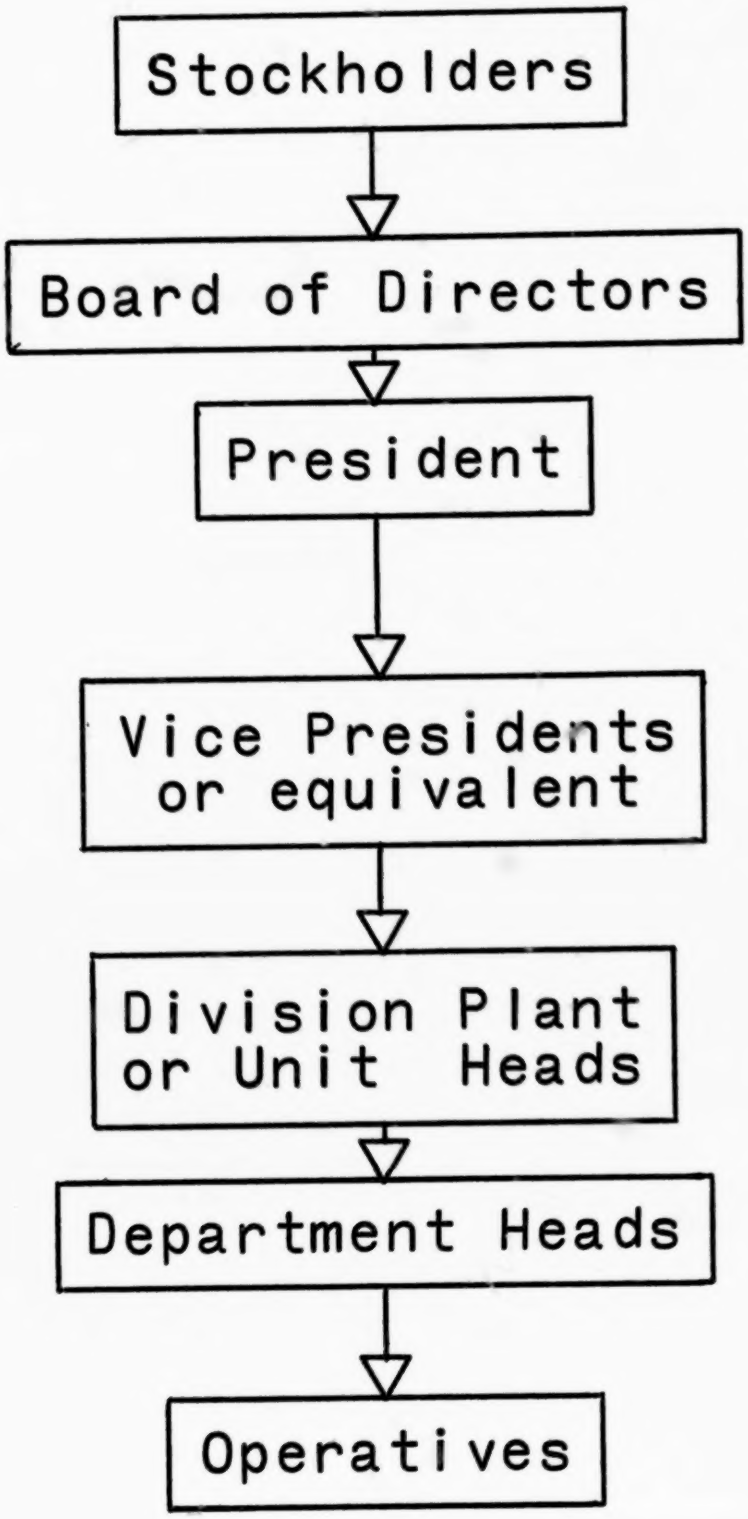
Immediate and effective authority and control

Geographic and functional activity and control

Integration of operations

Supervision of operations

Performance of operations


Stockholders
Board of Directors
President
Vice Presidents or equivalent
Division Plant or Unit Heads
Department Heads
Operatives

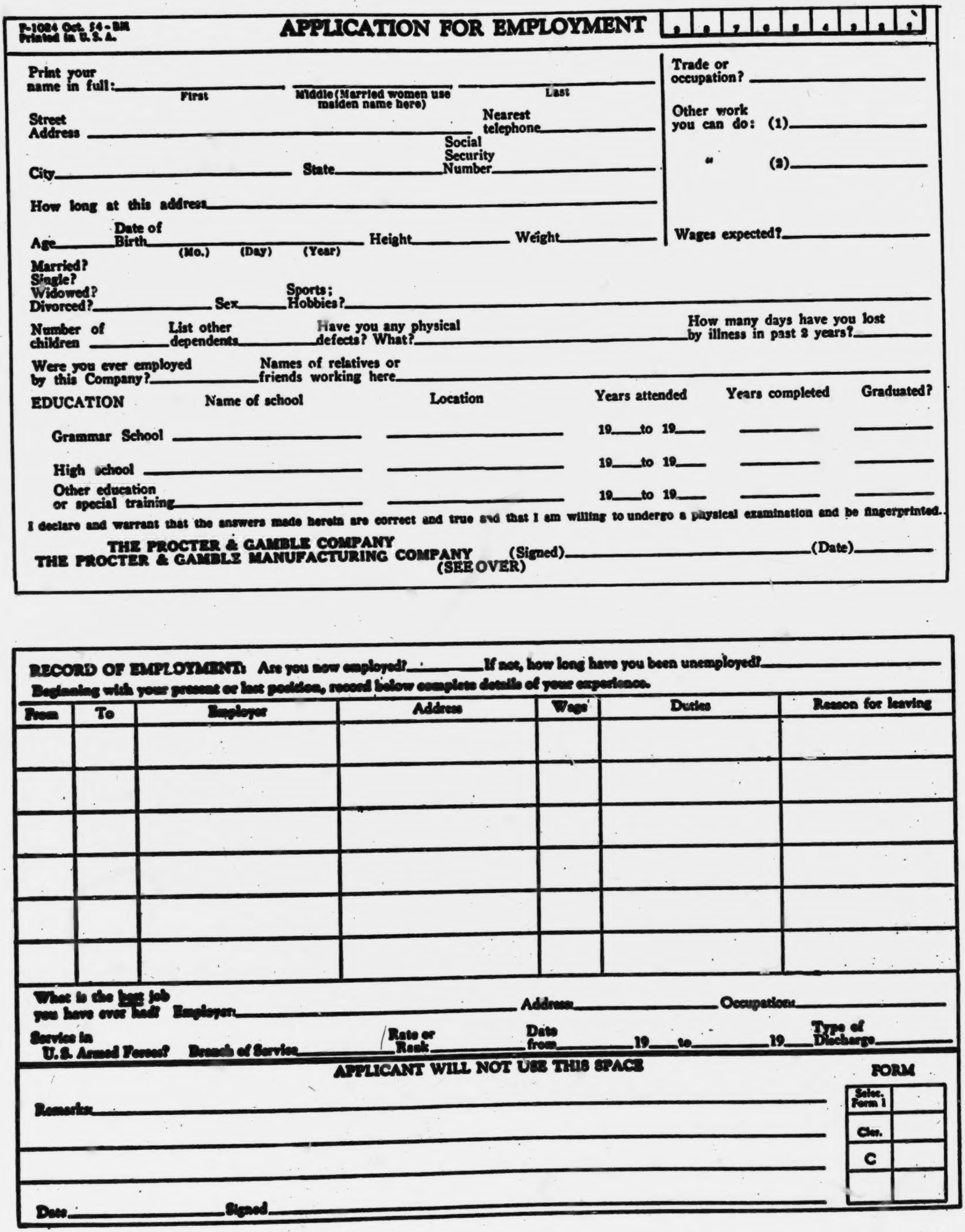
WHEELER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 144.

FUNCTIONS OF INDUSTRIAL RELATIONS

DEVELOPING AND ADMINISTERING POLICIES AND PROGRAMS FOR PROVIDING AN EFFECTIVE ORGANIZATIONAL STRUCTURE, SECURING EMPLOYEES, IMPROVING THEIR PRODUCTIVITY, PROVIDING ADEQUATE COMPENSATION AND GENERAL WELFARE, AND PROVIDING AN EFFECTIVE COMMUNICATIONS PROGRAM.

EMPLOYMENT:	INSURING THAT ALL POSITIONS ARE FILLED BY COMPETENT PERSONNEL EFFICIENTLY.
WAGE & SALARY ADMINISTRATION:	INSURING THAT ALL EMPLOYEES ARE FAIRLY AND EQUITABLY COMPENSATED.
EMPLOYEE RELATIONS:	INSURING THAT ALL WORKING RELATIONSHIPS BETWEEN MANAGEMENT AND EMPLOYEES AND THE JOB SATISFACTION OF AND WORK OPPORTUNITIES FOR THE COMPANY'S PERSONNEL ARE DEVELOPED AND MAINTAINED IN THE BEST INTERESTS OF THE COMPANY AND ITS EMPLOYEES.
ORGANIZATION PLANNING AND DEVELOPMENT:	INSURING THAT THE COMPANY IS EFFECTIVELY ORGANIZED AND CAPABLY STAFFED.
EMPLOYEE SERVICES:	MAINTAINING THE GENERAL WELFARE OF EMPLOYEES AND ASSISTING THEM WITH PROBLEMS RELATED TO THEIR SECURITY AND PERSONAL WELL-BEING.

DEVELOPED BY STAFF
STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-160.



P-1024 Oct. 54-BM
Printed in U.S.A.

APPLICATION FOR EMPLOYMENT

9	8	7	6	5	4	3	2	1

Print your name in full: ________ First ________ Middle (Married women use maiden name here) ________ Last

Street Address ________ Nearest telephone ________

City ________ State ________ Social Security Number ________

How long at this address ________

Age ________ Date of Birth ________ (Mo.) (Day) (Year) Height ________ Weight ________

Trade or occupation? ________

Other work you can do: (1) ________

" (2) ________

Wages expected? ________

Married? Single? Widowed? Divorced? ________ Sex ________ Sports; Hobbies? ________

Number of children ________ List other dependents ________ Have you any physical defects? What? ________ How many days have you lost by illness in past 2 years? ________

Were you ever employed by this Company? ________ Names of relatives or friends working here ________

EDUCATION	Name of school	Location	Years attended	Years completed	Graduated?
Grammar School	________	________	19___ to 19___	________	________
High school	________	________	19___ to 19___	________	________
Other education or special training	________	________	19___ to 19___	________	________

I declare and warrant that the answers made herein are correct and true and that I am willing to undergo a physical examination and be fingerprinted.

THE PROCTER & GAMBLE COMPANY
THE PROCTER & GAMBLE MANUFACTURING COMPANY (Signed) ________ (Date) ________

(SEE OVER)

RECORD OF EMPLOYMENT: Are you now employed? ________ If not, how long have you been unemployed? ________

Beginning with your present or last position, record below complete details of your experience.

From	To	Employer	Address	Wage	Duties	Reason for leaving

What is the best job you have ever had? Employer: ________ Address: ________ Occupation: ________

Service in U.S. Armed Forces? Branch of Service ________ Rate or Rank ________ Date from ________ 19___ to ________ 19___ Type of Discharge ________

APPLICANT WILL NOT USE THIS SPACE

Remarks: ________

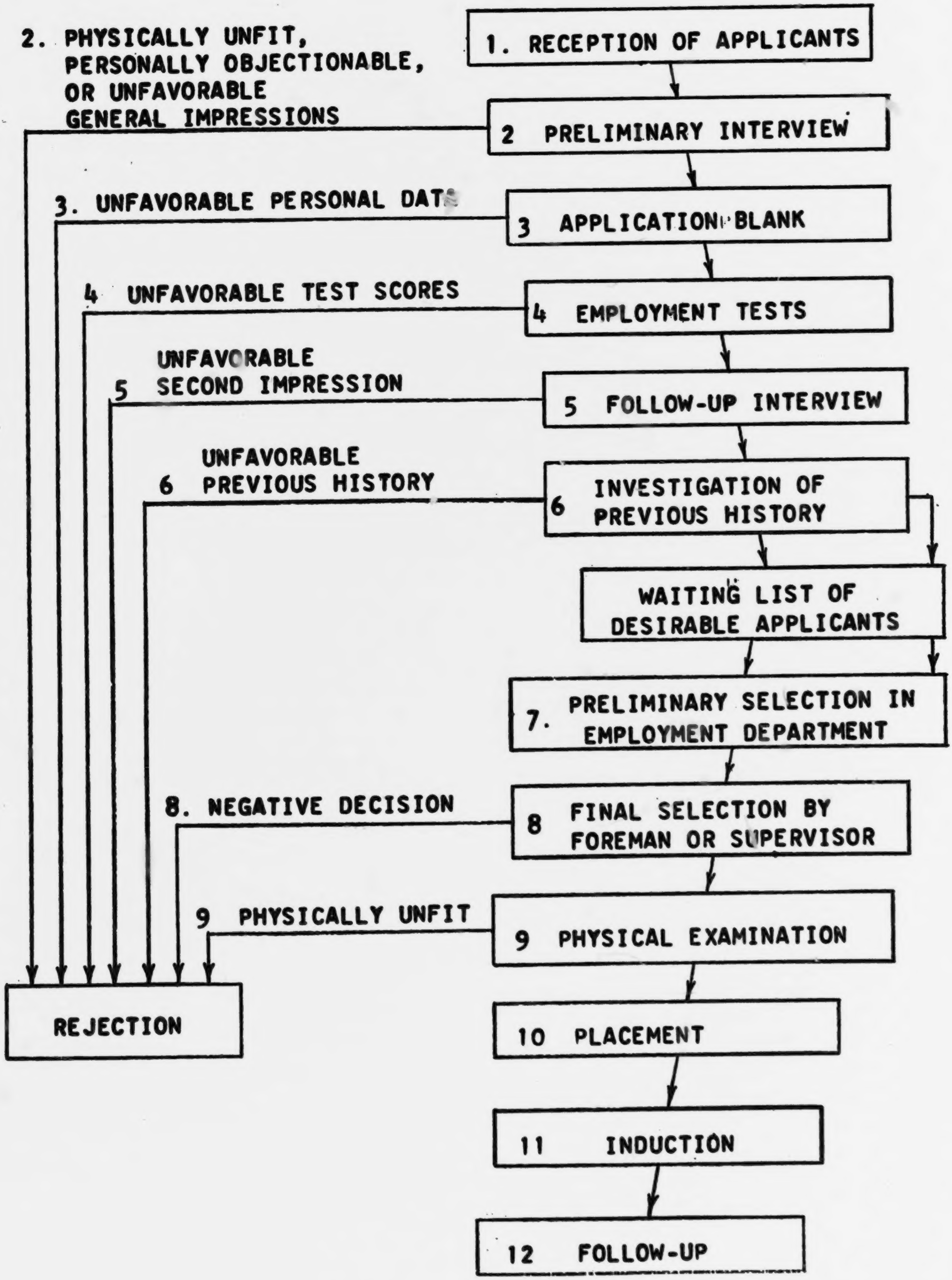
Date ________ Signed ________

FORM

Selec. Form 1	
Cler.	
C	

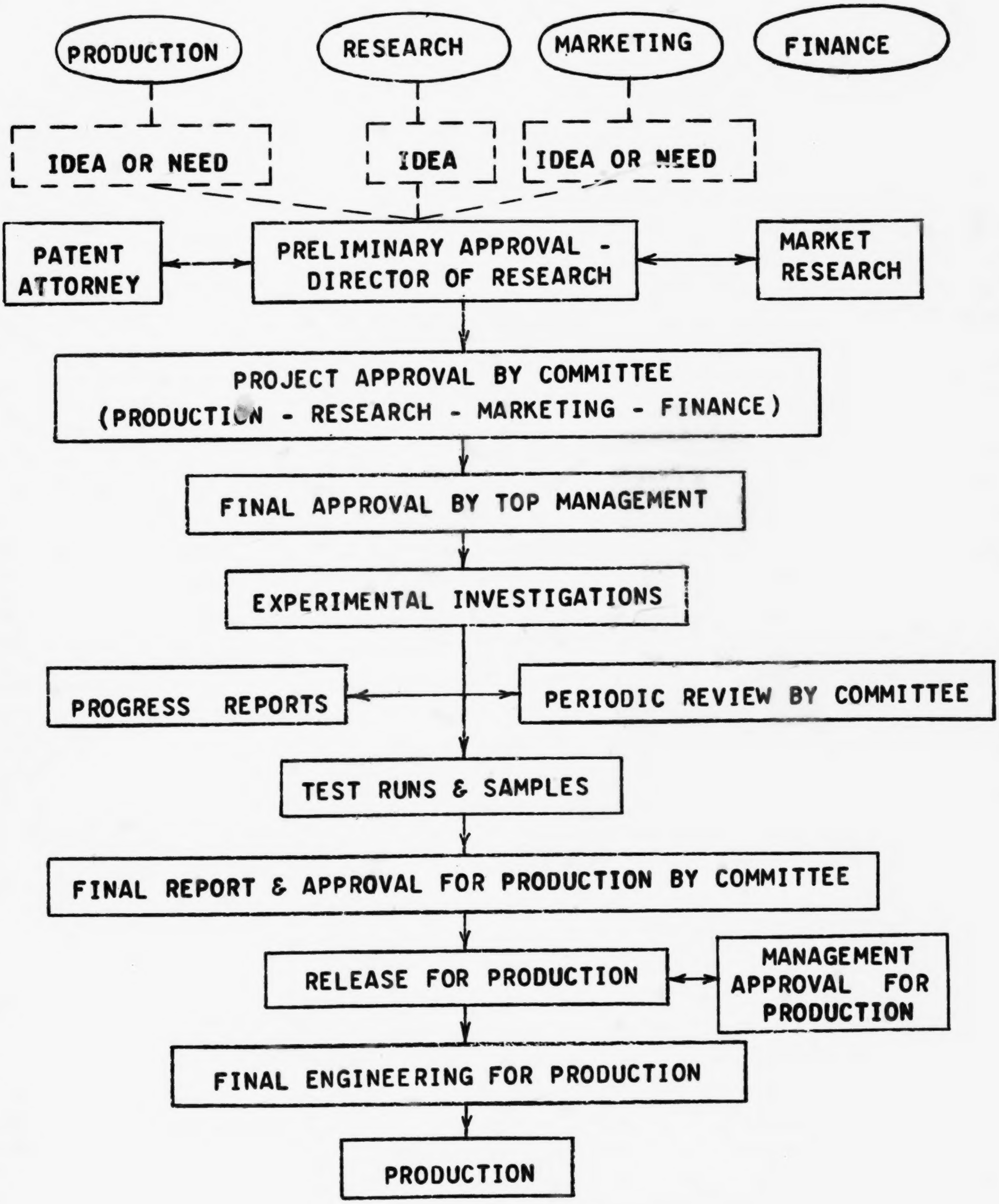
Figure 18-2. Application blank for factory workers. (Courtesy Procter & Gamble Co.)

SELECTION and EMPLOYMENT PROCEDURE

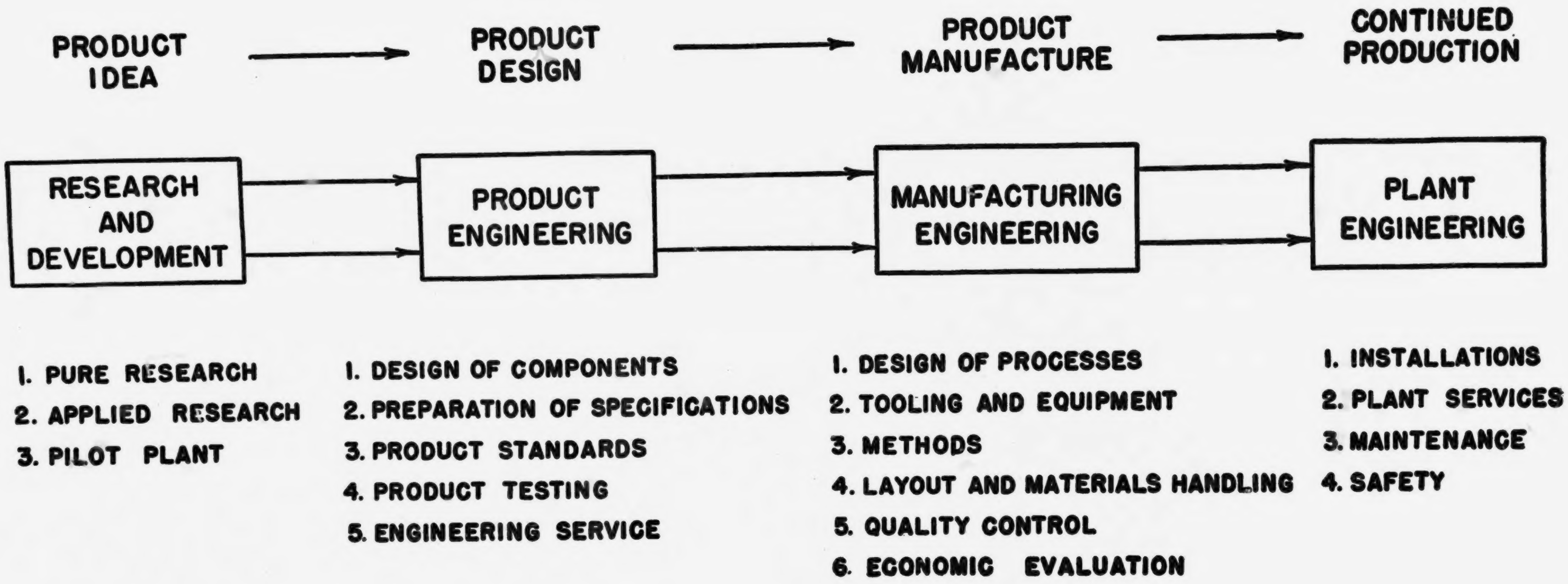

1. RECEPTION OF APPLICANTS
2 PRELIMINARY INTERVIEW
2. PHYSICALLY UNFIT, PERSONALLY OBJECTIONABLE, OR UNFAVORABLE GENERAL IMPRESSIONS
3 APPLICATION BLANK
3. UNFAVORABLE PERSONAL DATA
4 EMPLOYMENT TESTS
4 UNFAVORABLE TEST SCORES
5 FOLLOW-UP INTERVIEW
5 UNFAVORABLE SECOND IMPRESSION
6 INVESTIGATION OF PREVIOUS HISTORY
6 UNFAVORABLE PREVIOUS HISTORY
WAITING LIST OF DESIRABLE APPLICANTS
7. PRELIMINARY SELECTION IN EMPLOYMENT DEPARTMENT
8 FINAL SELECTION BY FOREMAN OR SUPERVISOR
8. NEGATIVE DECISION
9 PHYSICAL EXAMINATION
9 PHYSICALLY UNFIT
REJECTION
10 PLACEMENT
11 INDUCTION
12 FOLLOW-UP

BETHEL AND OTHERS, INDUSTRIAL ORGANIZATION AND MANAGEMENT, FIG. 19-1, P. 403.

TYPICAL PATH OF A RESEARCH PROJECT - IDEA TO PRODUCTION


PRODUCTION
RESEARCH
MARKETING
FINANCE
IDEA OR NEED
IDEA
IDEA OR NEED
PATENT ATTORNEY
PRELIMINARY APPROVAL - DIRECTOR OF RESEARCH
MARKET RESEARCH
PROJECT APPROVAL BY COMMITTEE (PRODUCTION - RESEARCH - MARKETING - FINANCE)
FINAL APPROVAL BY TOP MANAGEMENT
EXPERIMENTAL INVESTIGATIONS
PROGRESS REPORTS
PERIODIC REVIEW BY COMMITTEE
TEST RUNS & SAMPLES
FINAL REPORT & APPROVAL FOR PRODUCTION BY COMMITTEE
RELEASE FOR PRODUCTION
MANAGEMENT APPROVAL FOR PRODUCTION
FINAL ENGINEERING FOR PRODUCTION
PRODUCTION

GEORGE, MANAGEMENT IN INDUSTRY, P. 111.


PRODUCT IDEA
PRODUCT DESIGN
PRODUCT MANUFACTURE
CONTINUED PRODUCTION
RESEARCH AND DEVELOPMENT
PRODUCT ENGINEERING
MANUFACTURING ENGINEERING
PLANT ENGINEERING
1. PURE RESEARCH
2. APPLIED RESEARCH
3. PILOT PLANT
1. DESIGN OF COMPONENTS
2. PREPARATION OF SPECIFICATIONS
3. PRODUCT STANDARDS
4. PRODUCT TESTING
5. ENGINEERING SERVICE
1. DESIGN OF PROCESSES
2. TOOLING AND EQUIPMENT
3. METHODS
4. LAYOUT AND MATERIALS HANDLING
5. QUALITY CONTROL
6. ECONOMIC EVALUATION
1. INSTALLATIONS
2. PLANT SERVICES
3. MAINTENANCE
4. SAFETY

Three groupings of the engineering functions in manufacturing.

ARMINE AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 437.

RESEARCH AND DEVELOPMENT

APPLYING THE PROCESSES, OPERATIONS AND TECHNIQUES OF SCIENCE AND TECHNOLOGY TO CREATE PRODUCTS, PROCESSES, AND SERVICES WHICH MAY BENEFIT AN ENTERPRISE.

FUNCTIONS:

RESEARCH: EXPLORING NATURE SCIENTIFICALLY FOR THE PURPOSE OF INCREASING KNOWLEDGE OF THE UNIVERSE.

DEVELOPMENT: APPLYING SCIENTIFIC AND TECHNOLOGIC KNOWLEDGE TO CREATE NEW OR MODIFY EXISTING PRODUCTS AND PROCESSES SO THEY WILL BEST ACHIEVE STATED PERFORMANCE AND ECONOMIC REQUIREMENTS.

PRODUCT ENGINEERING: SPECIFYING, INTERPRETING, AND MODIFYING FOR MANUFACTURING AND MARKETING PURPOSES THE NATURE, PERFORMANCE, AND QUALITY CHARACTERISTICS OF PRODUCTS.

MAYNARD, *COMMON BODY OF KNOWLEDGE*, CHART III.

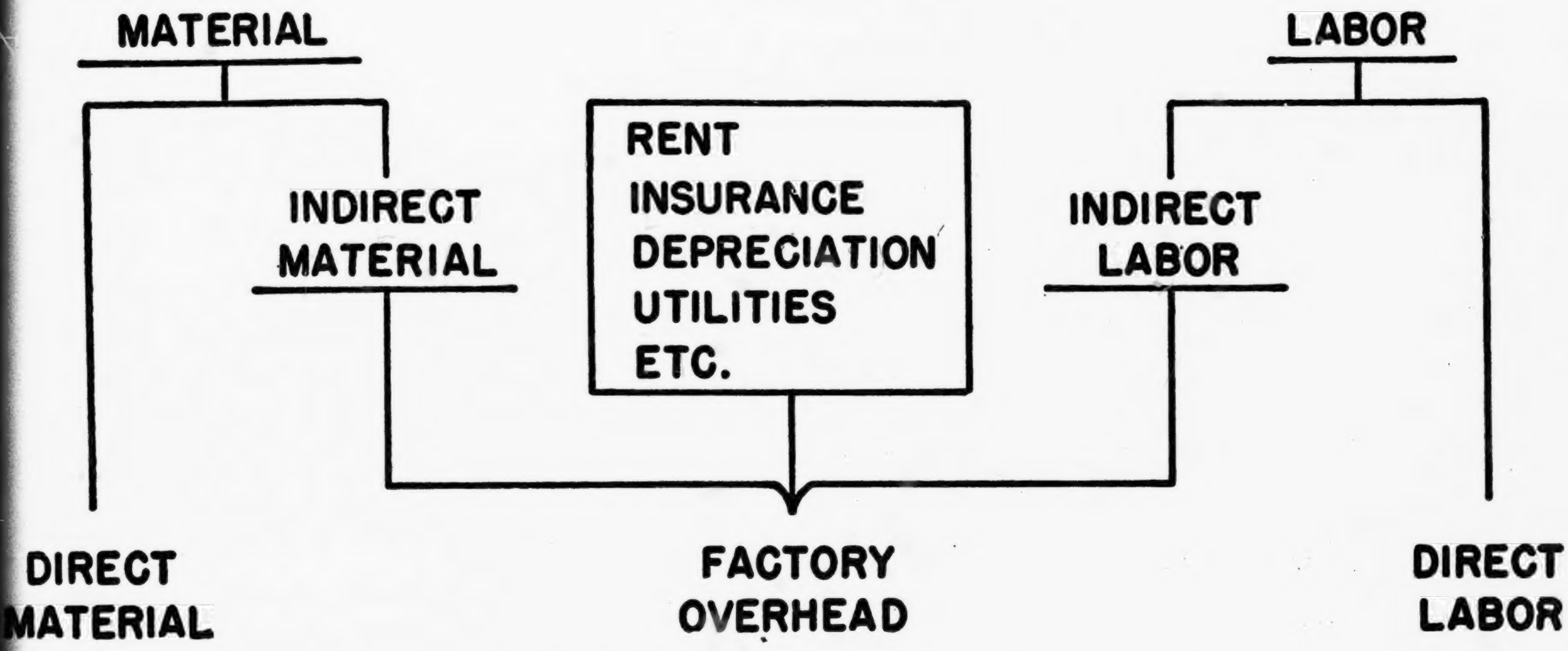

MATERIAL
LABOR
INDIRECT MATERIAL
RENT
INSURANCE
DEPRECIATION
UTILITIES
ETC.
INDIRECT LABOR
DIRECT MATERIAL
FACTORY OVERHEAD
DIRECT LABOR

Figure 17-1. Derivation of basic cost elements.

Amrine, Ritchey & Hulley. Manufacturing Organization & Management. Emglewood Cliffs, New Jersey: Prentice Hall Inc., 1966.

COST ANALYSIS & PROCESS CHART

PRODUCT NAME ____________________

WORKER'S NAME ____________________ DATE STARTED ____________

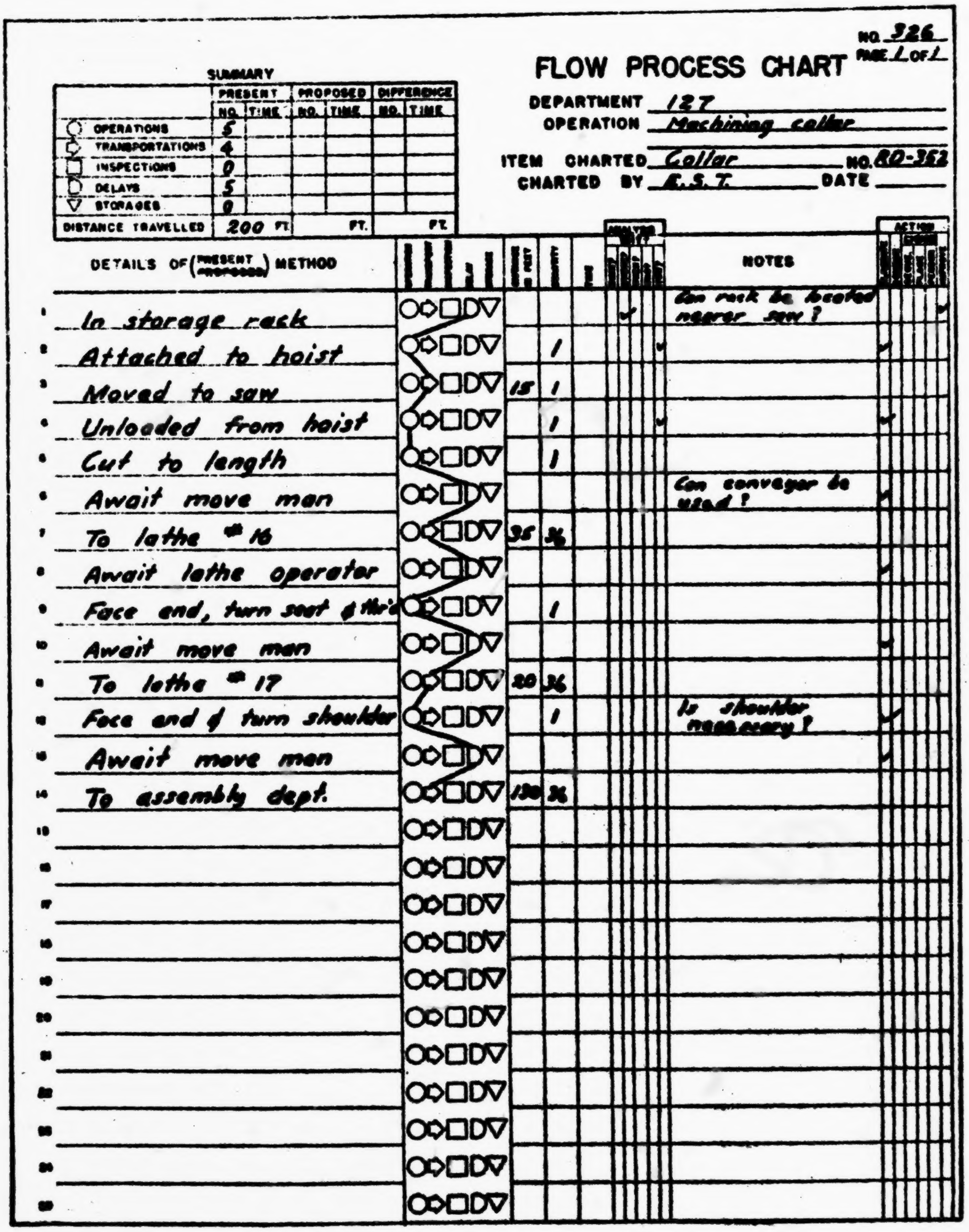
DIRECTOR'S O.K. (Teachers) ____________________ DATE COMPLETED ____________

MATERIALS NEEDED FOR PRODUCTION

Number of Pieces	Description of Material	Size	Cost
		Total Materials Cost	

PRODUCTION & TOOL ROUTING

Operation Number	Operation Description	Machine or Tool Used	Minutes per Operation



NO. 326
PAGE 1 OF 1

FLOW PROCESS CHART

DEPARTMENT 127
OPERATION Machining collar
ITEM CHARTED Collar NO. RD-362
CHARTED BY E.S.T. DATE

SUMMARY

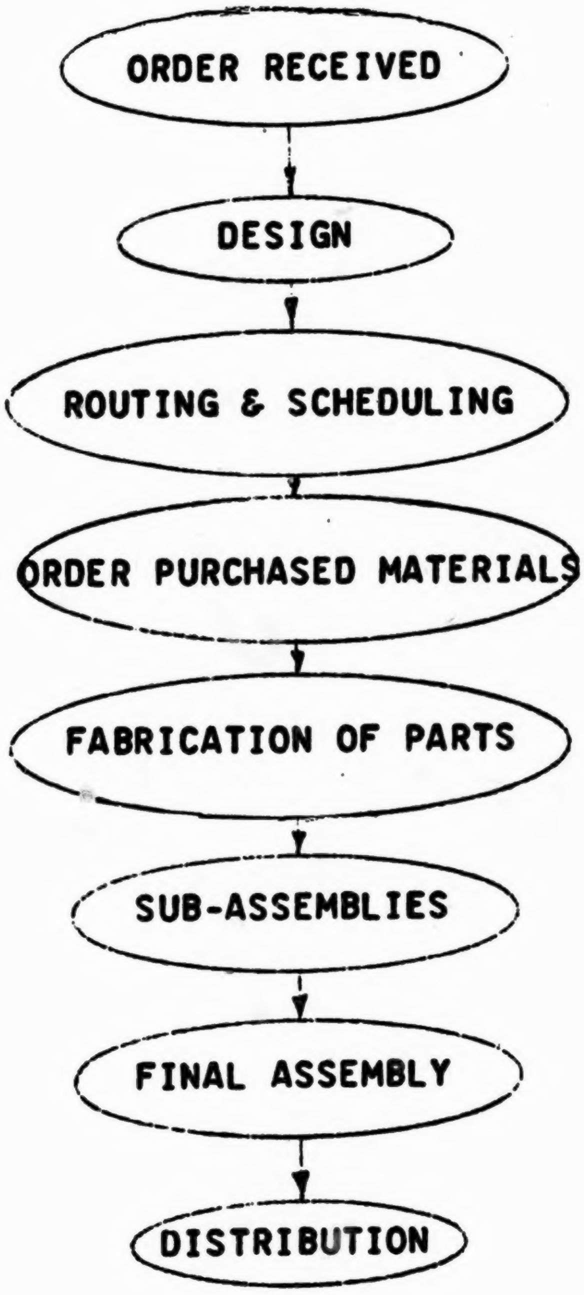
	PRESENT		PROPOSED		DIFFERENCE	
	NO.	TIME	NO.	TIME	NO.	TIME
○ OPERATIONS	5					
⇨ TRANSPORTATIONS	4					
□ INSPECTIONS	0					
D DELAYS	5					
▽ STORAGES	0					
DISTANCE TRAVELLED	200 FT.		FT.		FT.	

	DETAILS OF (PRESENT / PROPOSED) METHOD						NOTES	
1	In storage rack	○⇨□D▽				✓	Can rack be located nearer saw?	✓
2	Attached to hoist	○⇨□D▽		1		✓		✓
3	Moved to saw	○⇨□D▽	15	1				
4	Unloaded from hoist	○⇨□D▽		1		✓		✓
5	Cut to length	○⇨□D▽		1				
6	Await move man	○⇨□D▽					Can conveyor be used?	✓
7	To lathe # 16	○⇨□D▽	35	36				
8	Await lathe operator	○⇨□D▽						✓
9	Face end, turn seat & thr'd	○⇨□D▽		1				
10	Await move man	○⇨□D▽						✓
11	To lathe # 17	○⇨□D▽	20	36				
12	Face and & turn shoulder	○⇨□D▽		1			Is shoulder necessary?	✓
13	Await move man	○⇨□D▽						✓
14	To assembly dept.	○⇨□D▽	130	36				
15		○⇨□D▽						
16		○⇨□D▽						
17		○⇨□D▽						
18		○⇨□D▽						
19		○⇨□D▽						
20		○⇨□D▽						
21		○⇨□D▽						
22		○⇨□D▽						
23		○⇨□D▽						
24		○⇨□D▽						
25		○⇨□D▽						

Figure 7-2. Flow process chart for present method of manufacturing a steel collar.

Amrine, Ritchey & Hulley. Manufacturing Organization & Management. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1966.

Scheduling of Job Order


ORDER RECEIVED
DESIGN
ROUTING & SCHEDULING
ORDER PURCHASED MATERIALS
FABRICATION OF PARTS
SUB-ASSEMBLIES
FINAL ASSEMBLY
DISTRIBUTION

MACNIECE, PRODUCTION FORCASTING, PLANNING AND CONTROL, P. 215.

SPECIAL MFG. CO. **PRODUCTION AND MACHINE TOOL ROUTING** MIDWEST, IND.

PART NAME Cover - Gear Housing PART NO. 72845

MATERIAL Cast Iron ROUGH SIZE As Cast ROUGH WEIGHT 3 pounds DATE EFFECTIVE 8/15/66

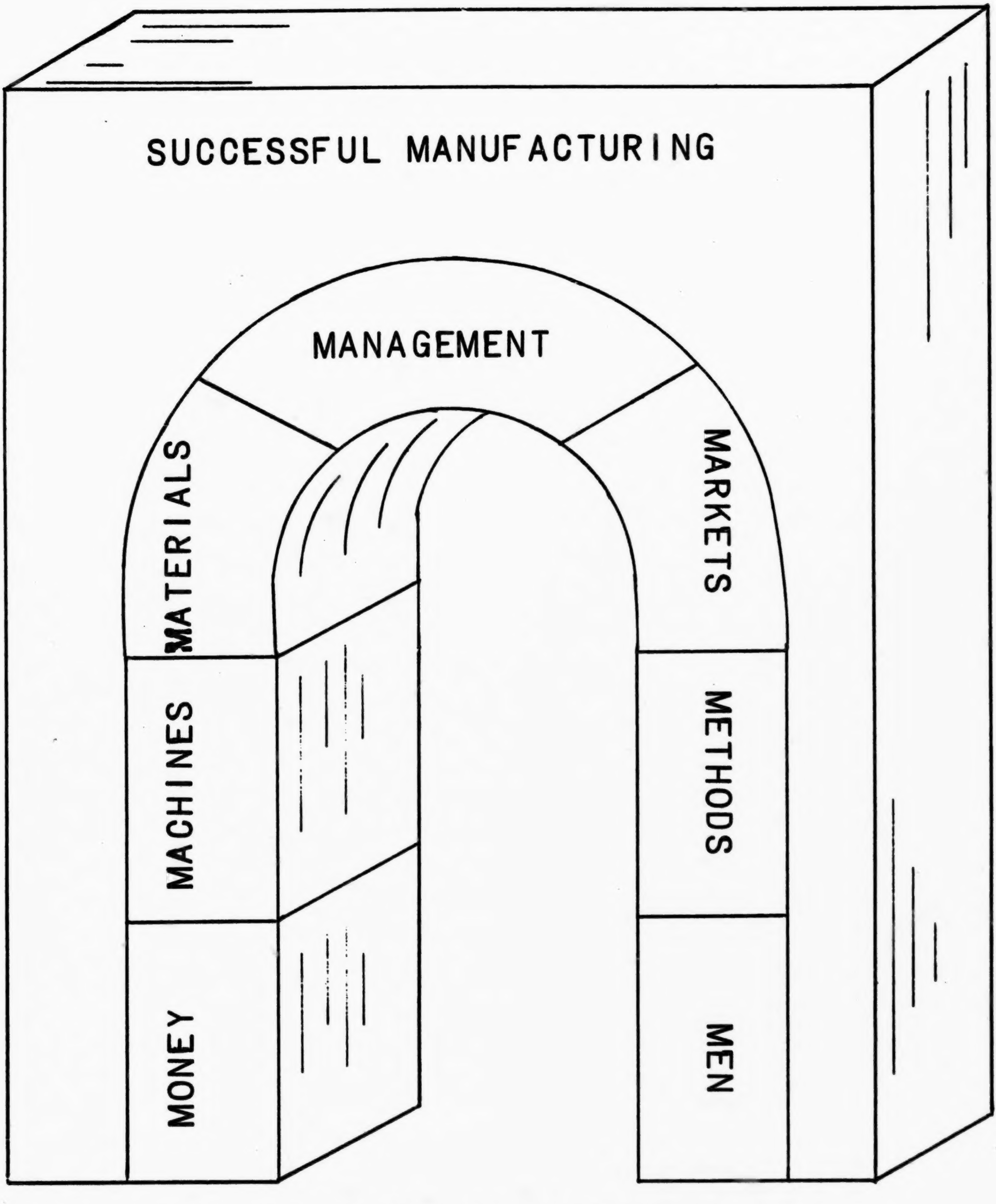
MODEL E-33 QUANTITY PER ASSEMBLY 1 SHEET NO. 1 OF 1

OP. NO.	DEPT. NO.	OPERATION NAME	MACHINE NAME	MACH NO.	TOOLS & GAGES	TOOL NO.	GROUP NO.	REQ. NO.	STD. TIME		CAP. EACH MACH. PER HOUR
									MINS.	HRS.	
	307	Receive	Receiving Dept.		(1) Foundry Insp. Fixture (1) Cutter Driver (2) Cutter	72845-T-1 72845-T-2 72845-T-3					
	327	Laboratory test	Laboratory		(1) Receiving Insp. Fixture	72845-T-4					
	317	Inspection	Bench								
	338	Stock	Stock Room		(1) Tool Layout	72845-T-5					
5	355	Locate-from (3) Foundry pads on edge of flange and on (3) foundry pads on back side of flange. Face end of casting to 1.3915 ±.005 from foundry pads on back side of flange. Finish face joint face of bolt flange to .829 ±.003 dim. from end of casting. Leave 1/32 rad. in corner. Finish turn pilot to 3.998 ±.001 dia. Leave 1/32 radius in corner. Break edges.	12" x 5' Leblond Engine Lathe.	777	(1)Face Plate Fixture (1) Tool Bit #DSF-2-NF (1) Flush Pin Gage to Check 1.3915 ±.005 dim. (1) Flush Pin Gage to check .829 ±.003 dim. (1) 3.998 ±.001 Snap Gage.	72845-T-6 Std. 72845-T-7 72845-T-8 Std.			3.60	.06	13.89
10	366	Final Inspection.	Bench		(1) Flush pin gage to check 1.3915 ±.005 dim. (1) Flush pin gage to check .829 ±.003 dim. (1) 3.998 _.001 snap gage.	72845-T-7 72845-T-8 Std.					

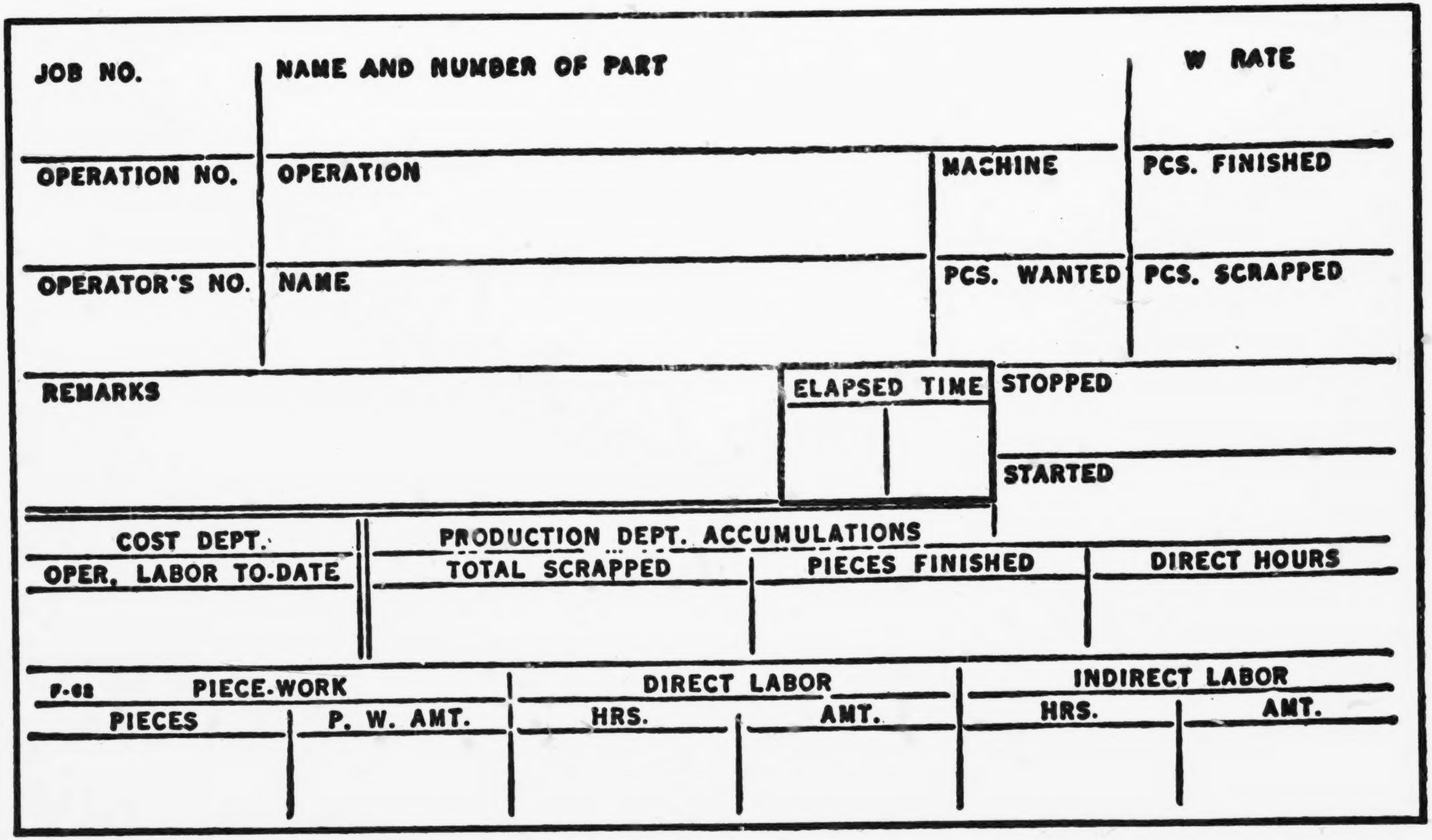
REMARKS:	ENGR. GROUP INDEX	ASSEMBLY NO.	WRITTEN BY	TOTALS PER PC.	.06	
		93724	C.E.M.	PER JOB		

Figure 14-1. A typical Standard route chart. (From L. E. Doyle, *Tool Engineering Analysis and Procedure*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1950. Reprinted by permission.)

INTER-RELATIONSHIP OF FACTORS FOR SUCCESSFUL MANUFACTURE


SUCCESSFUL MANUFACTURING
MANAGEMENT
MATERIALS
MARKETS
MACHINES
METHODS
MONEY
MEN

AMRINE AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 3.



JOB NO.

NAME AND NUMBER OF PART

W RATE

OPERATION NO.

OPERATION

MACHINE

PCS. FINISHED

OPERATOR'S NO.

NAME

PCS. WANTED

PCS. SCRAPPED

REMARKS

ELAPSED TIME

STOPPED

STARTED

COST DEPT.

OPER. LABOR TO-DATE

PRODUCTION DEPT. ACCUMULATIONS

TOTAL SCRAPPED

PIECES FINISHED

DIRECT HOURS

P-68

PIECE-WORK

PIECES

P. W. AMT.

DIRECT LABOR

HRS.

AMT.

INDIRECT LABOR

HRS.

AMT.

A typical job ticket. (Courtesy McCaskey Register Co.)

PRODUCTION

DEVELOPING THE MOST ECONOMICAL METHODS AND PLANS FOR MANUFACTURING AUTHORIZED PRODUCTS: COORDINATING THE REQUIRED MANPOWER; SECURING AND COORDINATING MATERIALS, TOOLS, FACILITIES, AND UTILITIES; PRODUCING PRODUCTS: AND CONSIGNING THEM TO THE MARKETING ACTIVITY OR CUSTOMER.

FUNCTIONS:

PLANT ENGINEERING:	SPECIFYING OR APPROVING, INSTALLING, MAINTAINING, AND OCCASIONALLY CONSTRUCTING THE BUILDINGS, UTILITY SERVICES, AND FACILITIES REQUIRED TO PRODUCE THE PRODUCTS.
INDUSTRIAL ENGINEERING:	PLANNING THE UTILIZATION OF MEN, FACILITIES, TOOLS, JIGS, AND FIXTURES TO ATTAIN THE DESIRED QUANTITY AND QUALITY OF OUTPUT AT MINIMUM COST.
PRODUCTION PLANNING & CONTROL:	PREPARING, ISSUING, AND ENCOURAGING COMPLIANCE WITH SCHEDULES OF THE MEN, MATERIALS, FACILITIES, INSTRUCTIONS, AND ALL ADDITIONAL ITEMS REQUIRED TO COMPLETE MANUFACTURING ORDERS SO THAT THEY WILL BE AVAILABLE WHEN AND WHERE REQUIRED.
MANUFACTURING:	MAKING PRODUCTS FOR SALE BY CHANGING THE SHAPE, COMPOSITION, OR COMBINATION OF MATERIALS, PARTS, OR SUB-ASSEMBLIES.
QUALITY CONTROL:	ESTABLISHING ACCEPTABLE LIMITS OF VARIATION IN THE ATTRIBUTES OF A PRODUCT AND REPORTING THE STATUS OF MAINTAINING THE PRODUCT IN RESPECT TO THOSE LIMITS.

ACME, COMMON BODY OF KNOWLEDGE, P. 54.

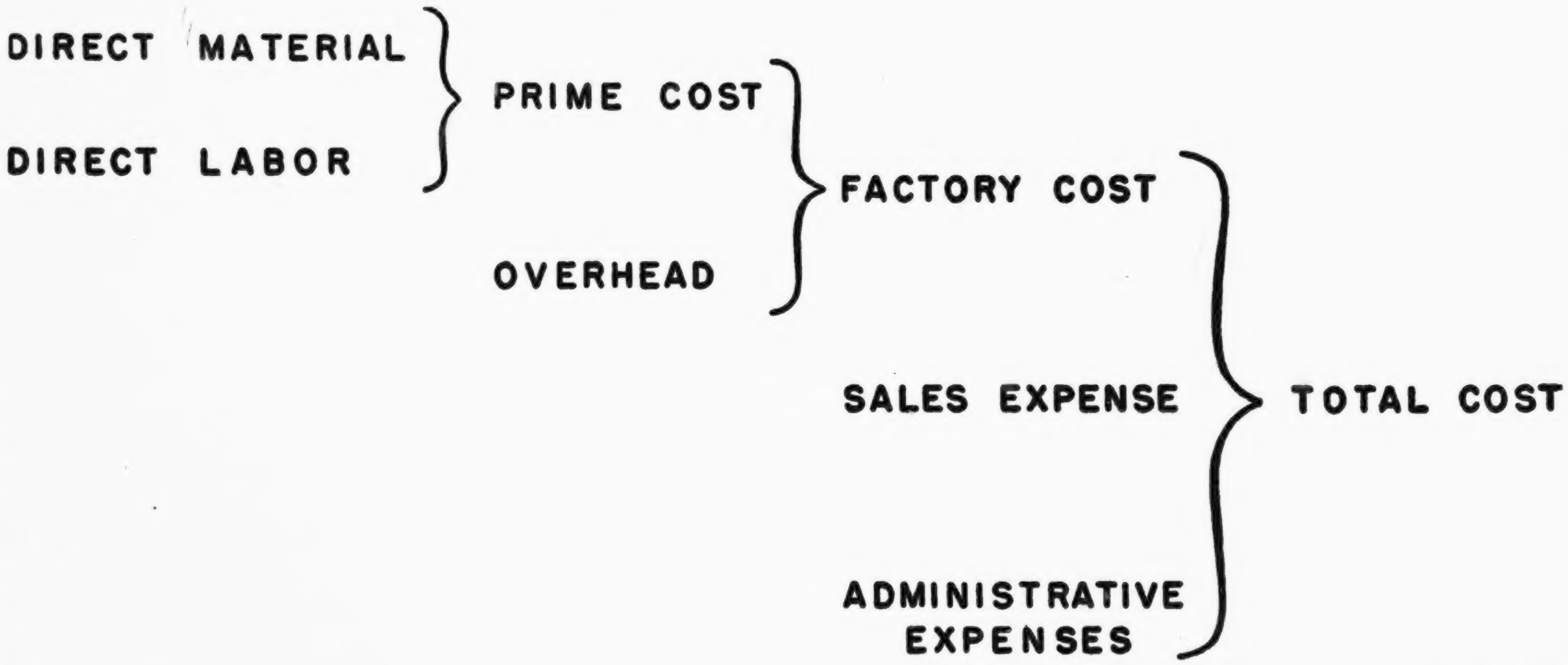
VEHICLE DIVISION	COMPANY MANAGEMENT	PRODUCT ENGINEERING	MANUFACTURING ENGINEERING	PRODUCTION CONTROL	PURCHASING
(1) DESIGNS NEW PRODUCTS.	(2) APPROVES NEW PRODUCTS (PRODUCT PLANNING COMMITTEE). (3) ESTABLISHES PLANT PLANNING VOLUMES (FINANCE). (16) ESTABLISHES MONTHLY OFFICIAL PRODUCTION PROGRAM (SCHEDULING COMMITTEE).	(4) DESIGNS PARTS THROUGH RESEARCH AND EXPERIMENTS. (5) DEVELOPS SPECIFICATIONS FOR PARTS AND MATERIALS.	(6) DETERMINES SOURCE AND MANUFACTURING ROUTING.	(7) RECEIVES ENGINEERING INFORMATION. (8) ESTABLISHES EFFECTIVE POINTS FOR ENGINEERING CHANGES. (9) COORDINATES ENGINEERING CHANGES. (10) ISSUES PARTS PURCHASE REQUISITIONS FOR PARTS AND MATERIALS. (14) RECEIVES COPY OF PURCHASE ORDERS. (15) ESTABLISHES FLOATS. (17) RECEIVES MONTHLY OFFICIAL PRODUCTION PROGRAM. IF A VEHICLE DIVISION, OR QUANTITATIVE SHIPPING INSTRUCTIONS IF A PARTS SUPPLIER. (18) SCHEDULES THE MANUFACTURING OF VEHICLES OR PARTS. (19) SCHEDULES PARTS AND MATERIALS FROM COMPANY AND OUTSIDE SUPPLIERS. (20) FOLLOWS FOR INCOMING SHIPMENTS. (21) RECEIVES INCOMING SHIPMENTS. (22) DELIVERS PARTS AND MATERIALS TO MANUFACTURING AREAS. (23) COORDINATES MANUFACTURING. (24) SHIPS FINISHED PRODUCT. (25) ISSUES NOTICES OF CANCELLATION. (28) DISPOSES OF OBSOLETE PARTS AND MATERIALS.	(11) RECEIVES PARTS PURCHASE REQUISITIONS. (12) NEGOTIATES CONTRACTS TO SUPPLY PARTS AND MATERIALS. (13) ISSUES PURCHASE ORDERS. (26) CANCELS PURCHASE ORDERS. (27) DETERMINES DISPOSITION OF OBSOLETE PARTS AND MATERIALS.

REVISED AUGUST 20, 1950

Courtesy Ford Motor Co.

HOW PRODUCTION CONTROL IN THE FORD MOTOR COMPANY RELATES TO OTHER ACTIVITIES.

DEVELOPMENT OF THE TOTAL COST OF A PRODUCT


DIRECT MATERIAL
DIRECT LABOR
PRIME COST
OVERHEAD
FACTORY COST
SALES EXPENSE
ADMINISTRATIVE EXPENSES
TOTAL COST

DIRECT MATERIAL

↓

MATERIALS THAT GO DIRECTLY INTO THE PRODUCT.

(SCRAP OR WASTE IS INCLUDED)

DIRECT LABOR

↓

LABOR THAT GOES DIRECTLY INTO THE PRODUCT.

OVERHEAD

↓

HEAT
SANDPAPER
PAINT
RENT
MAINTENANCE WORK
TELEPHONE
TAXES
INSURANCE
LIGHTS

SALES EXPENSES

↓

SALARIES & COMMISSIONS OF SALESMEN
TRAVEL EXPENSES
ADVERTISING

ADMINISTRATIVE EXPENSES

↓

SALARIES OF EXECUTIVES
SECRETARIAL SALARIES
LEGAL FEES

Revised from Amrine, Ritchey, and Hulley, *Manufacturing Organization and Management*, p. 322.

Name:________________________ Section:__________

INDUSTRIAL ARTS PRODUCT EVALUATION SHEET

Directions: Read the description of each grading area listed below and then grade your product in the section marked student at the bottom of the page. Circle the number you feel you deserve for each grading area. The instructor will then grade the product in the area marked instructor. Add the total number of points and determine your grade from the chart at the bottom.

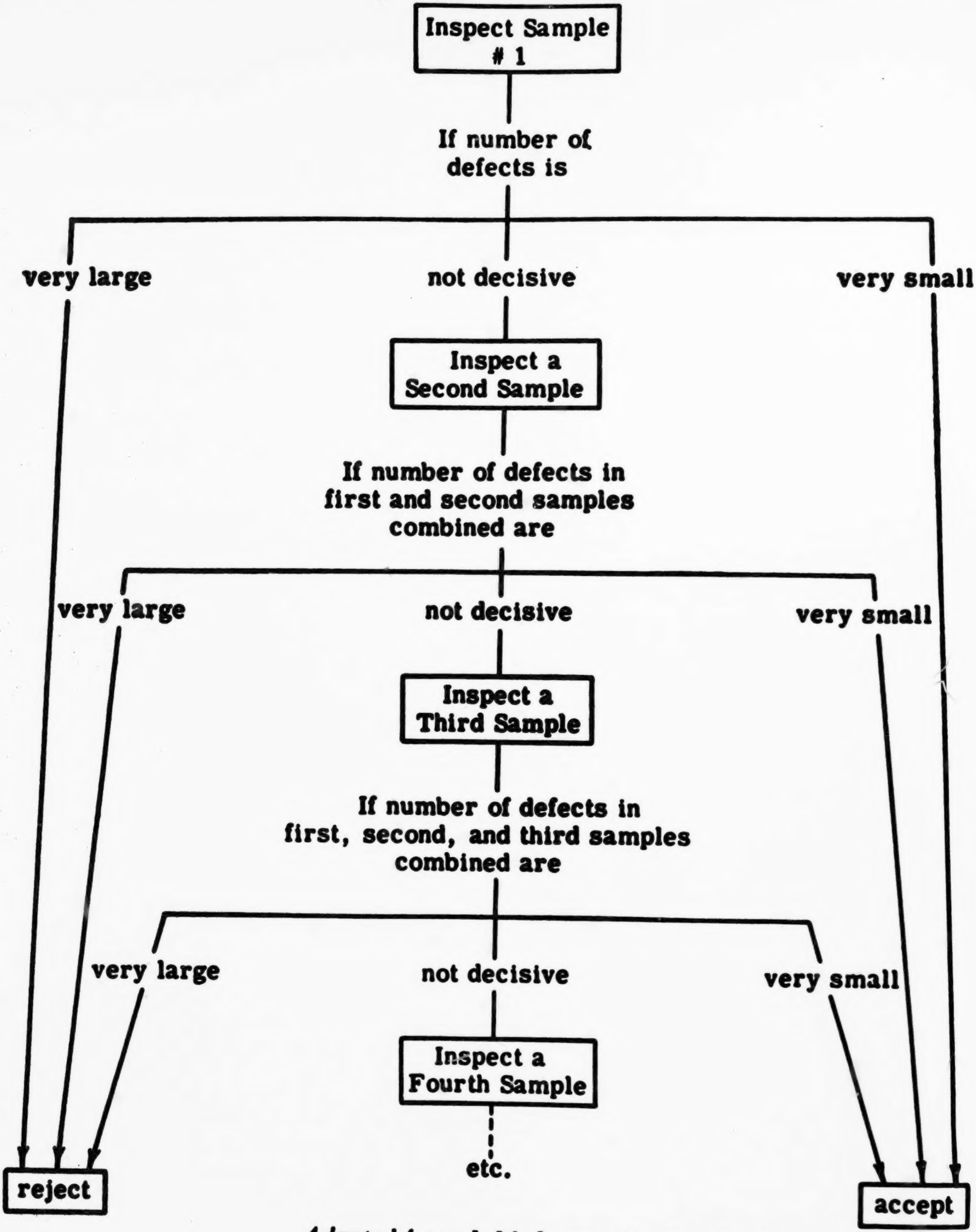
1. Design: Is the product well designed, does it do the job it was intended to do, was the design your idea?
2. Planning and Sketching: Were the plans and sketches done well enough to construct the product accurately, were they complete and neat?
3. Difficulty: Is the product hard to make (5 points), of medium difficulty (3 points), or easy to make (2 points).
4. Use of Hand and Machine Tools: Were hand and machine tools used properly and safely?
5. Use of Materials: Were materials used in the best possible way with the least possible waste?
6. Construction: Is the product constructed as well as it should be and as well as you can construct it?
7. Appearance: Does the product look good, is it something that you can be proud of, would you buy one like it?
8. Accuracy: Is the product constructed according to plans that were approved?
9. Finish: Is the finish applied properly and evenly, is it smooth and free from marks and scratches?
10. Use of Time: Did you make the best use of your time in the manufacture of your product, did you waste time?
11. Work on your own: Are you able to work on your product with only limited help from the instructor?
12. Attitude: Are you a hard worker, do you do your work well, do you help others, do you clean up well each day?

Student Use Only	Excellent	Good	Average	Below Average	Poor	Instr. Use Only	Excellent	Good	Average	Below Average	Poor
1. Design	5	4	3	2	1		5	4	3	2	1
2. Planning	5	4	3	2	1		5	4	3	2	1
3. Difficulty	5		3	2			5		3	2	
4. Use of Tools	5	4	3	2	1		5	4	3	2	1
5. Materials	5	4	3	2	1		5	4	3	2	1
6. Construction	5	4	3	2	1		5	4	3	2	1
7. Appearance	5	4	3	2	1		5	4	3	2	1
8. Accuracy	5	4	3	2	1		5	4	3	2	1
9. Finish	5	4	3	2	1		5	4	3	2	1
10. Use of Time	5	4	3	2	1		5	4	3	2	1
11. Own Work	5	4	3	2	1		5	4	3	2	1
12. Attitude	5	4	3	2	1		5	4	3	2	1
Total Points:						Total Points:					

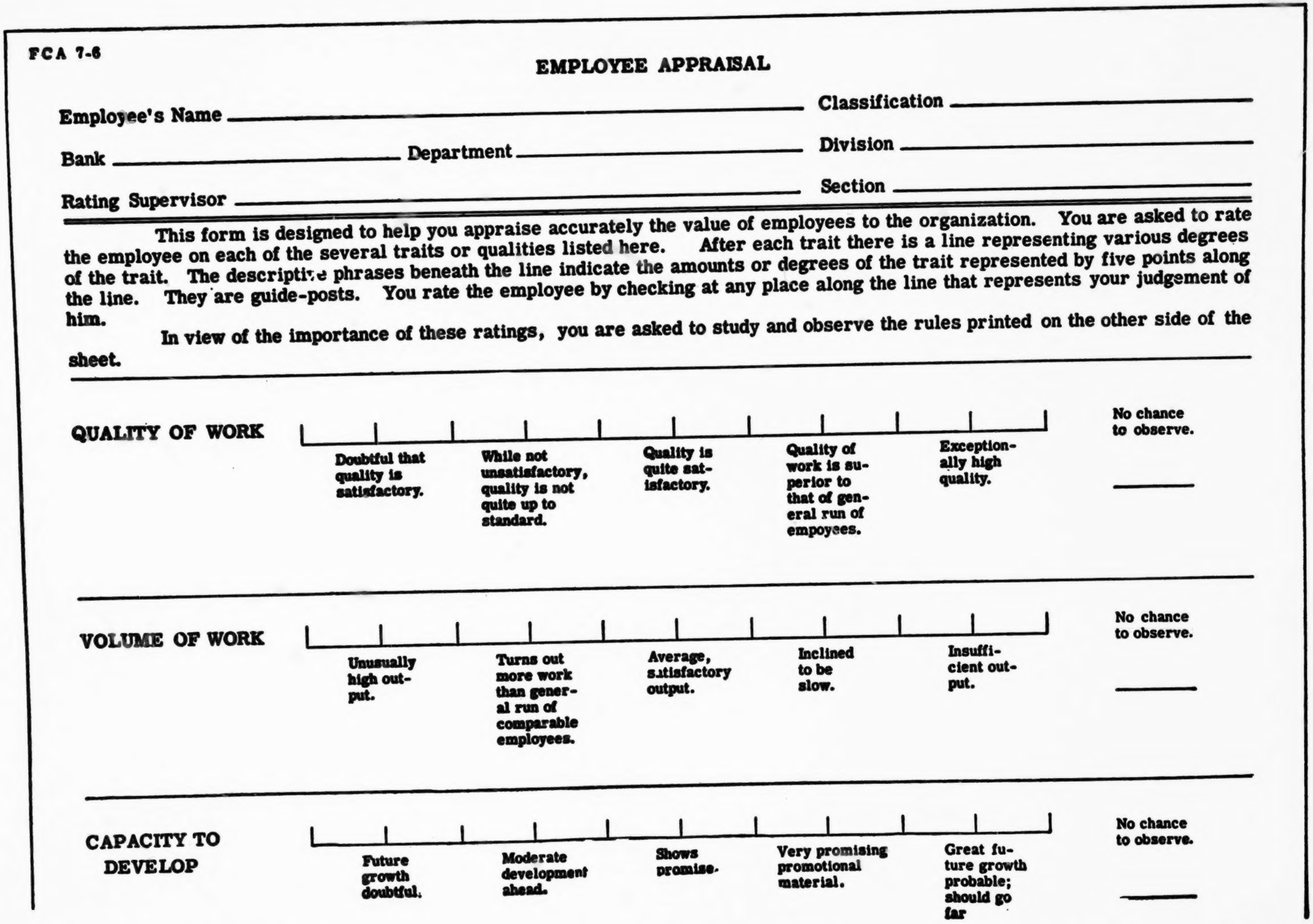
Grade: _____

Grade: _____

0-17 Poor (F)
18-29 Below Average (D)
30-41 Average (C)
42-53 Good (B)
54-60 Excellent (A)


Inspect Sample # 1
If number of defects is
very large
not decisive
very small
Inspect a Second Sample
If number of defects in first and second samples combined are
very large
not decisive
very small
Inspect a Third Sample
If number of defects in first, second, and third samples combined are
very large
not decisive
very small
Inspect a Fourth Sample
etc.
reject
accept

Adapted from J. M. Juran, ed., Quality Control Handbook, *(New York: McGraw-Hill Book Co., Inc., 1951), p. 432.*



FCA 7-6

EMPLOYEE APPRAISAL

Employee's Name ______________________ Classification ______________

Bank ____________ Department ____________ Division ______________

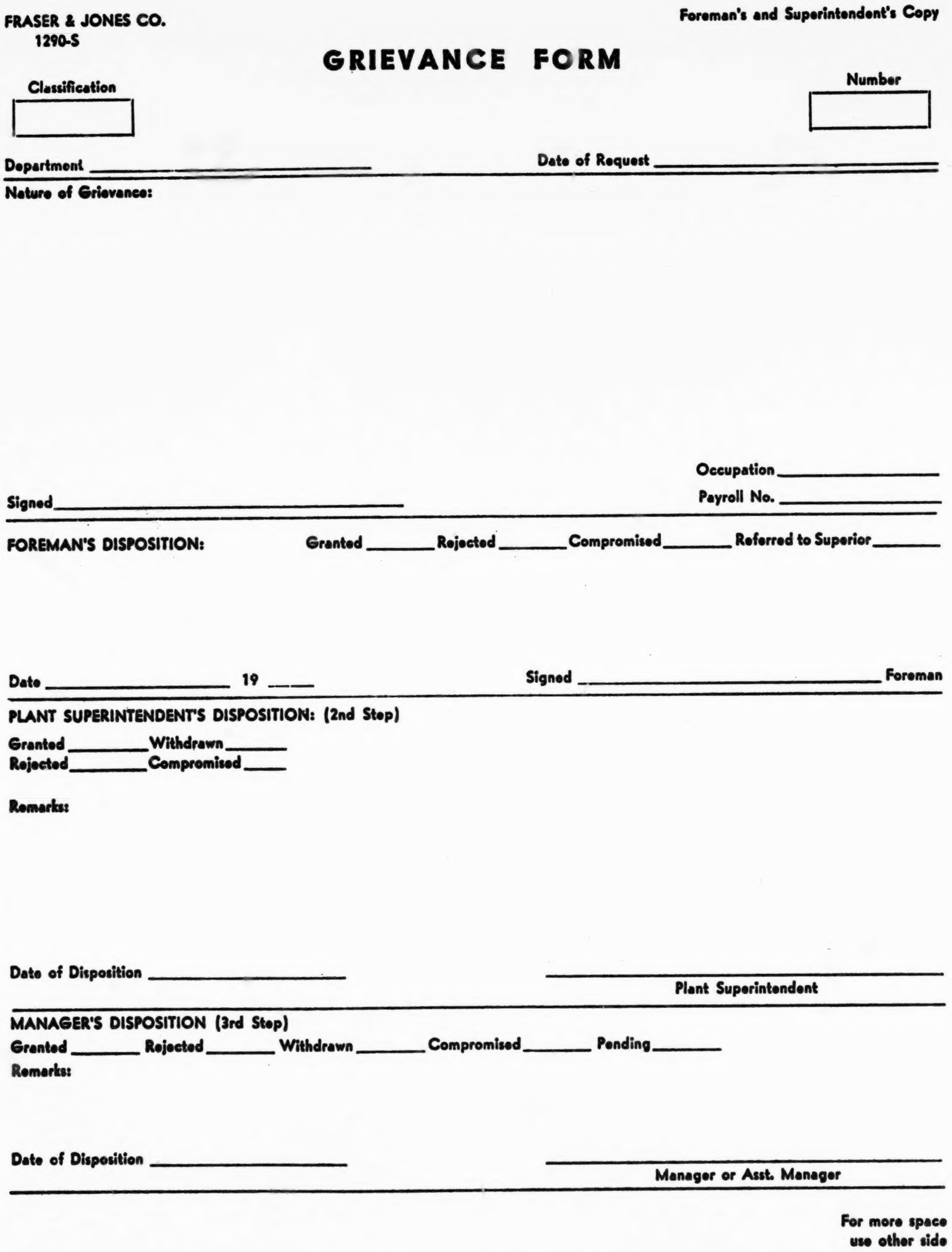
Rating Supervisor ______________________ Section ______________

This form is designed to help you appraise accurately the value of employees to the organization. You are asked to rate the employee on each of the several traits or qualities listed here. After each trait there is a line representing various degrees of the trait. The descriptive phrases beneath the line indicate the amounts or degrees of the trait represented by five points along the line. They are guide-posts. You rate the employee by checking at any place along the line that represents your judgement of him.

In view of the importance of these ratings, you are asked to study and observe the rules printed on the other side of the sheet.

QUALITY OF WORK	Doubtful that quality is satisfactory.	While not unsatisfactory, quality is not quite up to standard.	Quality is quite satisfactory.	Quality of work is superior to that of general run of empoyees.	Exceptionally high quality.	No chance to observe. ______
VOLUME OF WORK	Unusually high output.	Turns out more work than general run of comparable employees.	Average, satisfactory output.	Inclined to be slow.	Insufficient output.	No chance to observe. ______
CAPACITY TO DEVELOP	Future growth doubtful.	Moderate development ahead.	Shows promise.	Very promising promotional material.	Great future growth probable; should go far	No chance to observe. ______

Portion of a simple personnel rating scale using descriptive phrases. (From W. G. Ireson and E. L. Grant, *Handbook of Industrial Engineering and Management*, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1955. Reprinted by permission.)



FRASER & JONES CO.
1290-S

Foreman's and Superintendent's Copy

GRIEVANCE FORM

Classification ☐

Number ☐

Department ____________________ **Date of Request** ____________________

Nature of Grievance:

Occupation ____________________

Signed ____________________ **Payroll No.** ____________________

FOREMAN'S DISPOSITION: **Granted** ________ **Rejected** ________ **Compromised** ________ **Referred to Superior** ________

Date ____________________ **19** ____ **Signed** ____________________ **Foreman**

PLANT SUPERINTENDENT'S DISPOSITION: (2nd Step)

Granted ________ **Withdrawn** ________
Rejected ________ **Compromised** ________

Remarks:

Date of Disposition ____________________ ____________________
Plant Superintendent

MANAGER'S DISPOSITION (3rd Step)

Granted ________ **Rejected** ________ **Withdrawn** ________ **Compromised** ________ **Pending** ________

Remarks:

Date of Disposition ____________________ ____________________
Manager or Asst. Manager

For more space
use other side

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-167.

MARKETING FUNCTIONS

DEFINITION: DIRECTING AND ENCOURAGING THE FLOW OF GOODS FROM PRODUCER TO CONSUMER OR USER.

MARKETING RESEARCH: GATHERING, RECORDING, AND ANALYZING FACTS RELATING TO THE TRANSFER AND SALE OF PRODUCTS.

ADVERTISING: THE NON-PERSONAL PRESENTATION AND PROMOTION OF IDEAS, PRODUCTS, OR SERVICES PAID FOR BY A SPONSOR.

SALES PROMOTION: SUPPLEMENTING AND CO-ORDINATING PERSONAL SELLING AND ADVERTISING FOR GREATER EFFECTIVENESS.

SALES PLANNING: PLANNING FOR MARKETING THE RIGHT PRODUCTS AT THE RIGHT PLACE, AT THE RIGHT TIME, IN THE RIGHT QUANTITIES, AND AT THE RIGHT PRICE.

SALES OPERATIONS: TRANSFERRING PRODUCTS TO CUSTOMERS IN EXCHANGE FOR MONEY.

PHYSICAL DISTRIBUTION: MOVING AND HANDLING PRODUCTS FROM THE POINT OF STORAGE TO THE POINT OF CONSUMPTION OR USE.

BETHEL, AND OTHERS, INDUSTRIAL ORGANIZATION AND MANAGEMENT, P. 534.

NON-LEGAL
ONE SHARE
$1.00
PAR VALUE

Stock Certificate

NON-TRANSFERABLE
CERTIFICATE NUMBER
No 0125

DATE ____________

This Certifies That

____
first name initial last name number street

____ IS THE OWNER OF
city state or province zip code

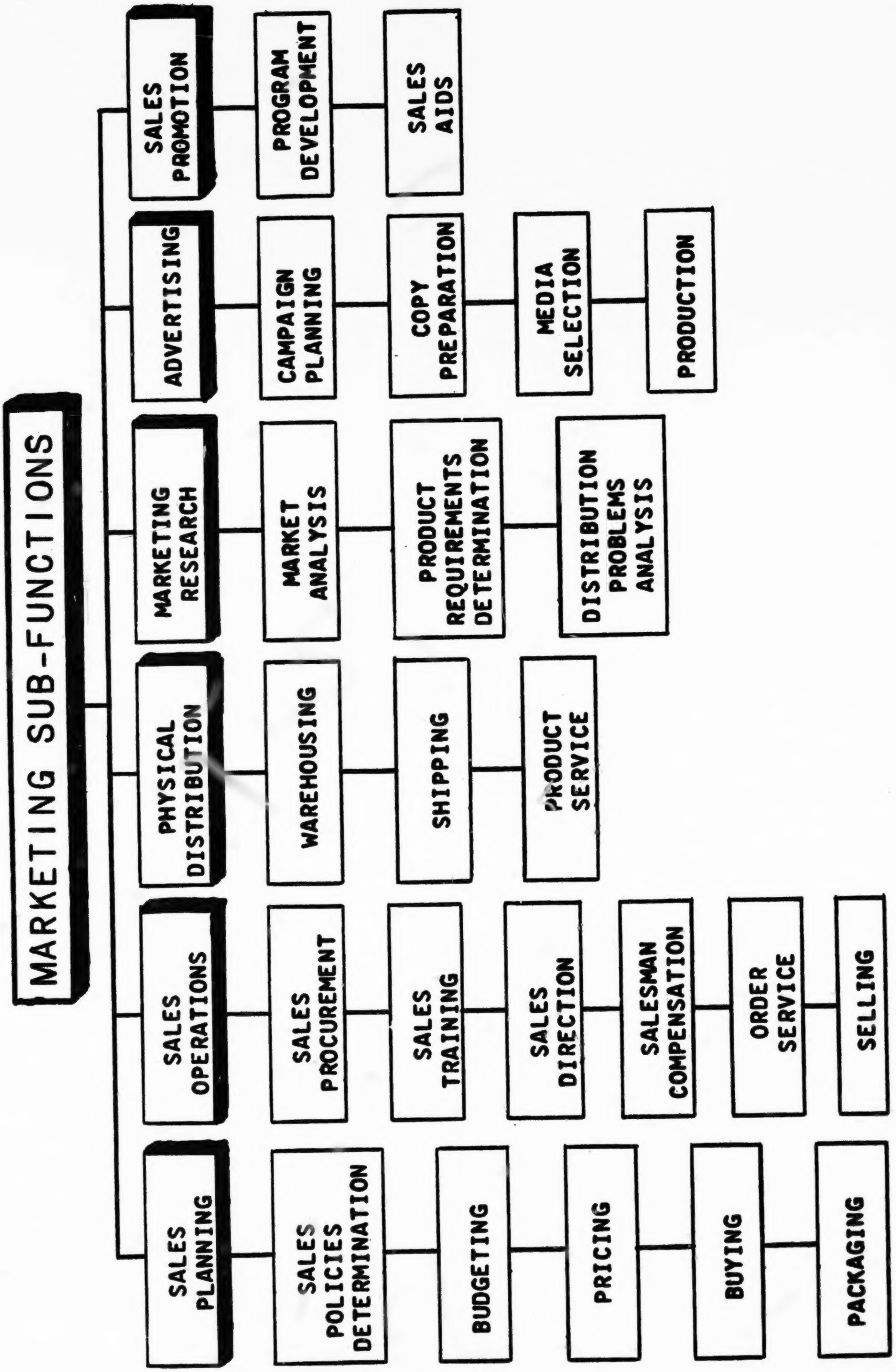
ONE SHARE, PAR VALUE ONE DOLLAR, OF THE CAPITAL STOCK OF

SCHOOL PRODUCTS, INC.

________________________________ SUBJECT TO INFORMATION ON THIS CERTIFICATE.
city state or province

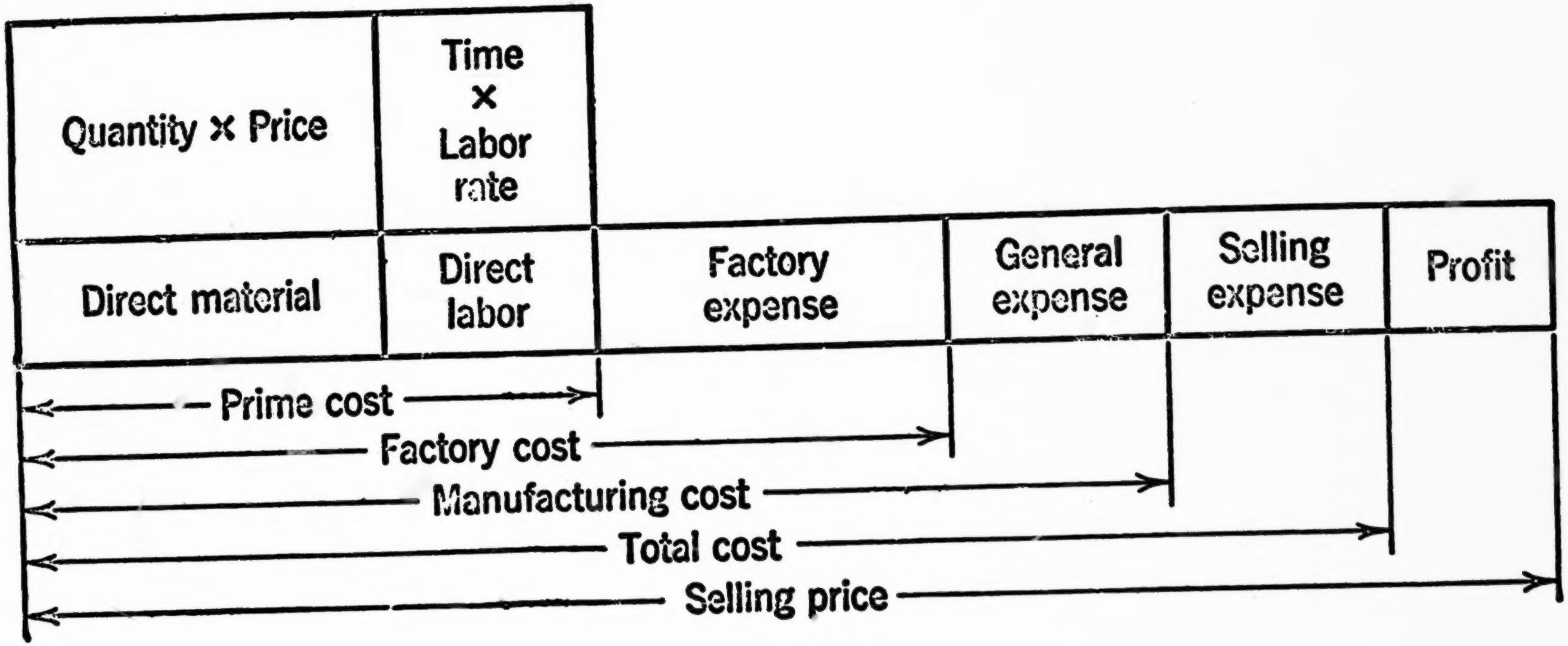
____
company representative stockholder

STOCKHOLDER VOTES FOR ELECTION OF BOARD OF DIRECTORS


MARKETING SUB-FUNCTIONS
SALES PLANNING
SALES POLICIES DETERMINATION
BUDGETING
PRICING
BUYING
PACKAGING
SALES OPERATIONS
SALES PROCUREMENT
SALES TRAINING
SALES DIRECTION
SALESMAN COMPENSATION
ORDER SERVICE
SELLING
PHYSICAL DISTRIBUTION
WAREHOUSING
SHIPPING
PRODUCT SERVICE
MARKETING RESEARCH
MARKET ANALYSIS
PRODUCT REQUIREMENTS DETERMINATION
DISTRIBUTION PROBLEMS ANALYSIS
ADVERTISING
CAMPAIGN PLANNING
COPY PREPARATION
MEDIA SELECTION
PRODUCTION
SALES PROMOTION
PROGRAM DEVELOPMENT
SALES AIDS

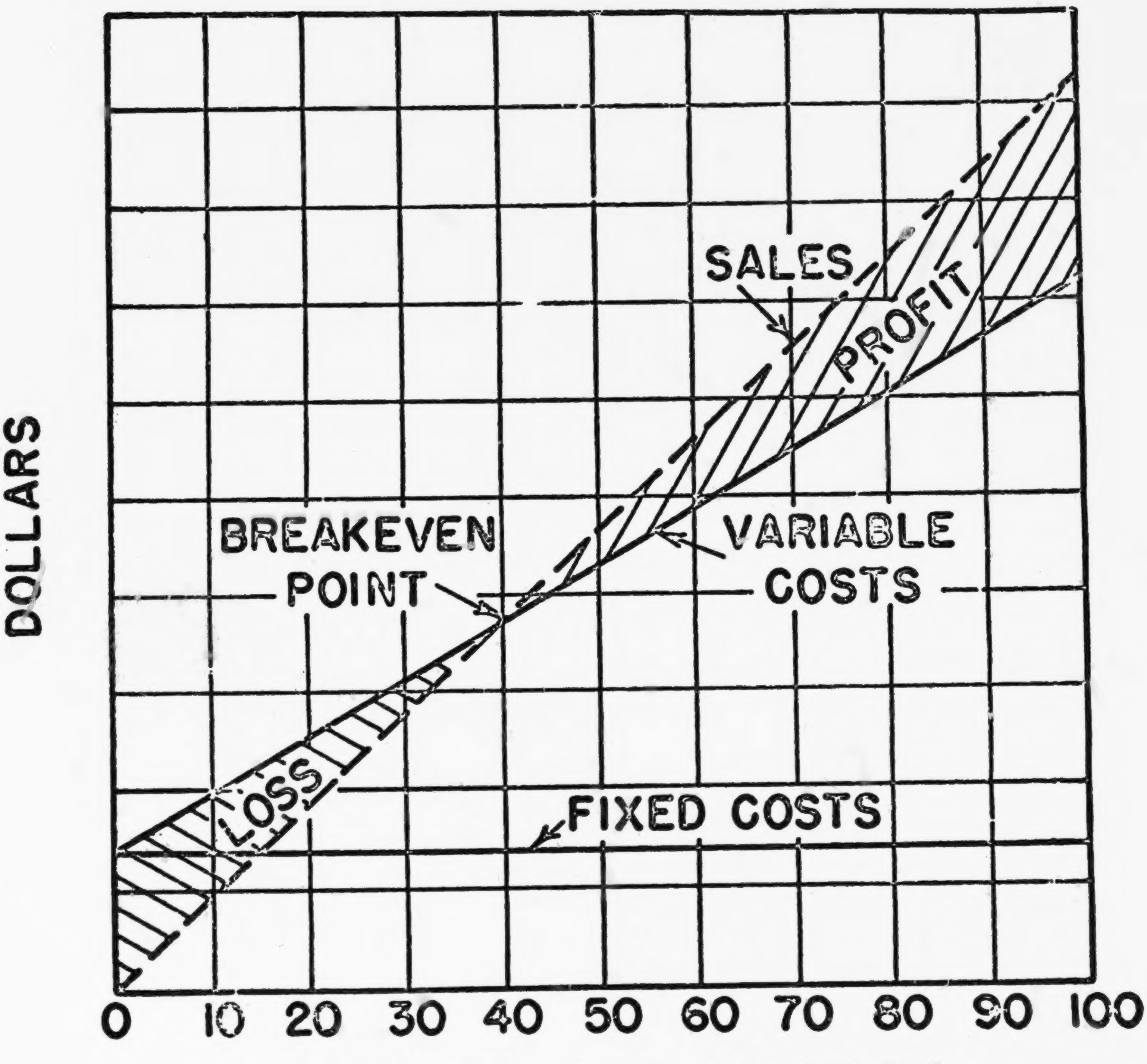
ACME, COMMON BODY OF KNOWLEDGE, CHART IV.

THE GENERAL COMPONENTS OF COST


Quantity × Price
Time × Labor rate
Direct material
Direct labor
Factory expense
General expense
Selling expense
Profit
Prime cost
Factory cost
Manufacturing cost
Total cost
Selling price

STRONG, THE MANAGEMENT OF BUSINESS, P. 143.

RELATION OF COSTS TO PROFIT



WHEELER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 247.

TOTAL COST & SELLING PRICE OF A PRODUCT

Direct material ____________________

Direct labor ____________________

==================== Prime cost
(Total of above two)

Overhead ____________________

==================== Factory cost
(Total of overhead
& prime cost)

Sales expense ____________________

Administrative
expenses ____________________

==================== TOTAL COST
(Total of factory cost, sales,
& administrative expenses)

Profit ____________________

==================== SELLING PRICE
(Total cost + Profit)

FUNCTIONS OF FINANCIAL CONTROL

PLANNING, DIRECTING, AND MEASURING THE RESULTS OF COMPANY MONETARY OPERATIONS.

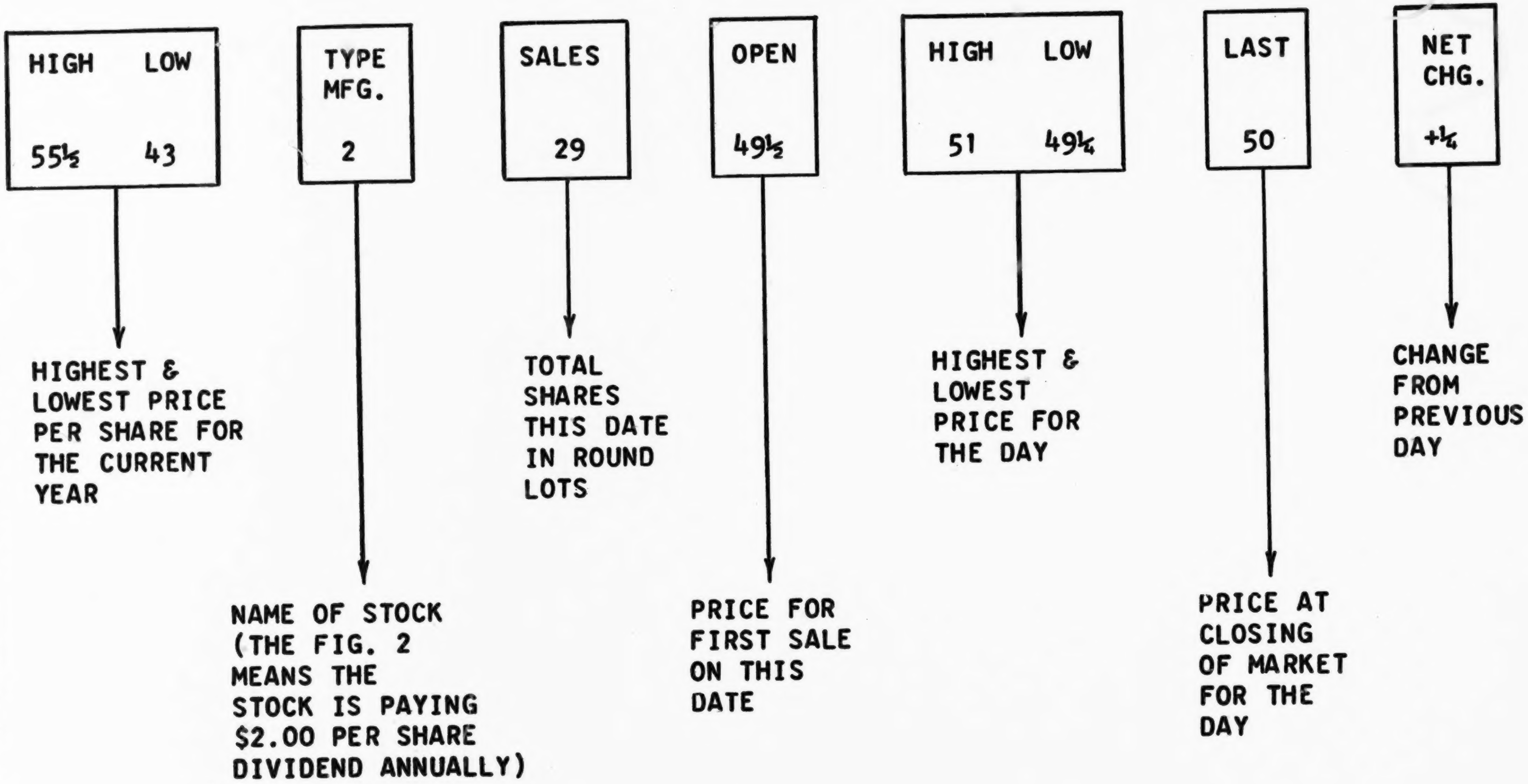
FINANCE: SECURING ADEQUATE OPERATING FUNDS AT MINIMUM COST: INVESTING SURPLUS FUNDS AT BEST ADVANTAGE: AND MAINTAINING A GOOD PECUNIARY REPUTATION FOR THE COMPANY.

CONTROL: MAINTAINING RECORDS AND PREPARING REPORTS TO (1) MEET CORPORATE, LEGAL AND TAX REQUIREMENTS AND (2) MEASURE THE RESULTS OF THE COMPANY OPERATIONS; AND PROVIDING ACCOUNTING SERVICES STRUCTURED FOR USE BY MANAGERS IN PLANNING AND CONTROLLING THE BUSINESS.

PURCHASING: SECURING WHEN REQUIRED AND AT MINIMUM COST THE QUANTITY AND QUALITY OF MATERIALS, SUPPLIES, SERVICES, AND EQUIPMENT NEEDED TO OPERATE THE COMPANY.

ACME, *COMMON BODY OF KNOWLEDGE*, CHART V.

HOW TO READ THE FINANCIAL PAGE OF YOUR NEWSPAPER


HIGH LOW
55½ 43
HIGHEST & LOWEST PRICE PER SHARE FOR THE CURRENT YEAR
TYPE MFG.
2
NAME OF STOCK (THE FIG. 2 MEANS THE STOCK IS PAYING $2.00 PER SHARE DIVIDEND ANNUALLY)
SALES
29
TOTAL SHARES THIS DATE IN ROUND LOTS
OPEN
49½
PRICE FOR FIRST SALE ON THIS DATE
HIGH LOW
51 49¼
HIGHEST & LOWEST PRICE FOR THE DAY
LAST
50
PRICE AT CLOSING OF MARKET FOR THE DAY
NET CHG.
+¼
CHANGE FROM PREVIOUS DAY

MUSSELMAN & HUGHES, INTRODUCTION TO MODERN BUSINESS, P. 333.

TOOLS AND EQUIPMENT:

The tools and equipment necessary for this unit will be those common to the laboratory of industries, including overhead projector, 16 mm. projector and screen.

MATERIALS AND SUPPLIES:

No special materials or supplies are needed in this unit. Those commonly found in the laboratory of industries are all that are required.

LESSONS TO BE TAUGHT:

- Local Household Accessories Industries and their Effect on Employment and the Economy
- Procedure in Selecting a Product
- Principles of Good Design
- Making Working Drawings and/or Sketches of Selected Product
- Selection of Materials for Individual Products
- Production Plan and/or Construction Details
- Types of Ownership
- Industrial Organization and Laboratory Personnel System
- Simple Layout Tools and Procedures
- Simple Cutting Tools and Procedures
- Simple Forming Tools and Procedures
- Simple Assembly Tools and Procedures
- Simple Holding Tools and Procedures
- Finishing, Methods and Materials
- Quality Control Procedures and Inspection
- Marketing Procedures

Title: Local Household Accessories Industries and their Effect on Employment and the Economy

Presentation:

I. Define household accessories industries

  A. An industry which produces articles for the home which make life more comfortable and convenient but which are not absolutely necessary

II. Effect on employment

  A. Local

    1. Varies with location

  B. National

    1, Hundreds of thousands of people employed

III. Local industries

  A. Names of

    1. Varies with location

  B. Why located in area

    1. Raw materials
    2. Labor supply
    3. Good market
    4. Type of skill required

IV. Effects on economy

  A. Breakdown of consumer dollar

    1. Taxes
    2. Food
    3. Clothing
    4. Savings
    5. Housing
    6. Others
      a. Accessory items

  B. Breakdown of industrial dollar

    1. Materials
    2. Dabor
    3. Overhead
    4. Profits

V. Production controls

A. Analysis of product

1. Time
2. Plant facilities
3. Materials
4. Skills

References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley, Manufacturing Organization and Management, pp. 468-489.

Title: Procedure in Selecting a Product

Presentation:

I. Selection of product in industry

  A. Engineering

    1. Need for the product
    2. Limitations
      a. Labor
      b. Management
      c. Materials
      d. Equipment
      e. Market
      f. Cost
    3. Selection of product
      a. List available possibilities
      b. Evaluate in terms of limitations
      c. Select product

II. Selection of product in laboratory of industries

  A. Engineering

    1. Must have need

    2. Must be household accessory

  B. Limitations

    1. Time

    2. Ease of construction
      a. Simple machinery
      b. Inexperienced students

    3. Adaptable to school situation

      a. Short class periods
      b. Limited equipment
      c. Limited materials

    4. Construction from sheet materials

      a. Examples of available sheet material

  C. Selection of the product

    1. List many possibilities

    2. Eliminate those not meeting limitations

    3. Select a product

References:

Harold Amrine and others, Manufacturing Organization and Management, pp. 442-444.

John Feirer and John Lindbeck, Industrial Arts Metalwork, p. 10.

John Feirer, Woodworking for Industry, p. 47.

Title: Principles of Good Design

Presentation:

- I. Selection of product to be designed
  - A. List examples of household accessories on board
  - B. Select bookrack as possible example
- II. Functions of design pertaining to bookrack
  - A. Strength
    - 1. Strong enough to hold books
    - 2. Materials not too heavy to appear awkward
  - B. Durability
    - 1. Joints strong enough
    - 2. Finish of lasting quality
  - C. Suitable materials
    - 1. Suitable to fulfill requirements
      - a. Sheet material
    - 2. Material suitable to match household surroundings
    - 3. Material suitable to construct bookrack
  - D. Attractive
    - 1. In materials
    - 2. In construction
    - 3. In finish
    - 4. In shape
  - E. Suitable size
    - 1. Adequate for number of books desired
    - 2. Adequate for size of books desired
    - 3. Suitable for place of intended use

References:

John Feirer, Woodworking for Industry, pp. 32-42, 48, 433.

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 12, 210.

Title: Making Working Drawings and/or Sketches of Selected Products

Presentation:

- I. Selection of product to be drawn
  - A. List examples of household accessories on board
  - B. Select bookrack as possible example
- II. Sketching procedure
  - A. Determine necessary views
    - 1. Front
    - 2. End
  - B. Front view
    - 1. Distribute paper
    - 2. Use lower left portion of paper
      - a. Draw base
      - b. Add end pieces onto base
        - 1) Show pieces of bookrack as example
        - 2) Draw only in proportion
          - a) Not to correct size
          - b) Use correct relationship of sizes
  - C. Side view
    - 1. Use lower right portion of paper
    - 2. Extend lines from front view to right
      - a. Draw base
      - b. Add side piece onto base
- III. Dimensioning
  - A. Determine necessary sizes
    - 1. Size of books
    - 2. Number of books
      - a. Length of base
      - b. Width of base
      - c. Width of side
      - d. Height of side
      - e. Distance between ends
- IV. Proceed in similar manner with selected product

Title: Selection of Materials Necessary for Individual Products

Presentation:

I. Product materials

  A. Definition

    1. Any thing that goes into the making of a product except for the time necessary to make it

  B. Our company is limited to sheet materials

    1. Sheet metals - both ferrous and nonferrous
    2. Plywood
    3. Hardboard
    4. Particle board
    5. Sheet plastics
    6. Leather

II. Cost analysis and process chart

  A. Use and purpose of the chart

    1. Material needed section
      a. Necessary to get materials
      b. Need total cost to establish selling price
    2. Production and tool routing section
      a. Necessary to organize work
      b. Need total time to complete the product in order to establish the selling price
    3. Relation to cooking a pizza
      a. Must know if the ingredients are available
      b. Must know cost of ingredients if they are to be purchased
      c. Need recipe to know the correct order to do the necessary steps

Reference:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley, Manufacturing Organization and Management, pp. 161-162, 258-270.

Title: Production Plan and/or Construction Details

Presentation:

I. Relate planning to the students

  A. What are you going to wear?

  B. What are you going to do?

II. Relate planning to method engineering in industry

  A. Production and tool routing forms

    1. Material
    2. Part name
    3. All operations listed
    4. Names of all machines listed
    5. Names of all tools listed
    6. Length of time noted

  B. Flow process chart

    1. All methods listed
    2. Chart for only one part
    3. What flow chart symbols mean

  C. Cost analysis and process chart

    1. Use and purpose of the form
      a. Production and routing
        1) Need planning
        2) Need work times for determining selling price

References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley, Manufacturing Organization and Management, pp. 116-120, 258-270.

Title: Types of Ownership

Presentation:

I. Ownership types

  A. Different types of ownership

    1. Individually-owned
    2. Partnership
    3. Cooperative
    4. Corporation

  B. Our company

    1. Partnership
      a. How it is formed
        1) Two or more people combine resources to carry on a legal business as co-owners
      b. Why it is formed
        1) To give more capital for the business
      c. Advantages
        1) More capital to work with
        2) Often to get someone with more knowledge of a specific function of business or manufacturing
      d. Disadvantages
        1) Owner's liability is all of the property of all owners

Reference:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley, Manufacturing Organization and Management, pp. 449-462.

Title: Industrial Organization and Laboratory Personnel

Presentation:

I. How industry organizes to take care of clean-up work

  A. Suggestions from class

  B. How these would work in school laboratories

II. Personnel system

  A. Organization of personnel system

    1. Board of directors
      a. Who they are
      b. What they do
    2. Shop superintendent
      a. Show transparency of entire personnel system
      b. Describe duties of shop superintendent
      c. Nominate and elect shop superintendent
    3. Shop foreman
      a. Show transparency of personnel system
      b. Describe duties of shop foreman
      c. Volunteer for position
    4. Tool foreman
      a. Show transparency of personnel system
      b. Describe duties of tool foreman
      c. Volunteer for position
    5. Safety engineer
      a. Show transparency of entire personnel system
      b. Describe duties of shop superintendent
      c. Volunteer for position
    6. Area supervisors
      a. Show laboratory division into four areas
      b. Show transparency of personnel system
      c. Describe duties of area supervisors
      d. Volunteers for positions
    7. Machinery workers
      a. Show transparency of entire personnel system
      b. Describe duties of machinery workers
      c. Volunteers for positions
    8. Bench workers
      a. Show transparency of personnel system
      b. Describe duties of bench workers
      c. Volunteers for positions
    9. Assistants
      a. Show transparency of personnel system
      b. Describe duties of assistants
      c. Volunteers for assistants

10. Waste supervisor
    a. Show transparency of entire personnel system
    b. Describe duties of waste supervisor
    c. Volunteer for position
11. Safety equipment supervisor
    a. Show transparency of entire personnel system
    b. Describe duties of safety equipment system
    c. Volunteer for position

References:

Harold Amrine, John Ritchey, and Oliver Hulley, *Manufacturing Organization and Management*, p. 339.

Claude George, Jr., *Management in Industry*, pp. 16-23.

Carl Gerbracht and Frank Robinson, *Understanding America's Industries*, pp. 225-227.

Observation of various personnel systems used in different schools and colleges.

PERSONNEL ORGANIZATION

Below are listed the duties to be performed by the various personnel officers and their helpers. These should be studied carefully by all members of the class and an effort to fulfill them should be made by those appointed or elected to office and those assigned as helpers.

Shop Superintendent:

1. Help the instructor in every way possible.
2. Coordinate the work of the various foremen.
3. Help the instructor in clean-up inspection.
4. Assist in training the workers on their jobs.
5. Assist any other foreman needing help.

Foreman:

Shop Foreman

1. Supervise the various clean-up jobs, inspect them when completed.
2. Make clean-up assignments as directed by the superintendent.
3. Maintains the shop in a neat, clean and orderly manner.
4. Assists in training helpers in their jobs.

Tool Foreman

1. Checks tools for loose handles, broken parts, etc.
2. Checks all tool panels at the beginning and end of each period to be sure all tools are in proper places.

Safety Engineer

1. Checks machines to see that guards and other vital parts are in good working order.
2. Report all safety rule violations to instructor.
3. Checks lighting and ventilation when necessary.
4. Assists other men in his department when necessary.

PERSONNEL ORGANIZATION (Continued)

Area Supervisors:

1. Sweep areas thoroughly after benches and machines have been cleaned.
2. Pick up all usable scrap, abrasive, screws, nuts, bolts, etc., and place in their proper containers.
3. Supervise the other workers in your area.
4. Report to the shop foreman.

Benches:

1. Return any tools to proper place on panels.
2. Clean tops of benches and vises in your area.
3. Clean and arrange equipment on shelves under benches.
4. Report to area supervisors.

Machinery and Equipment:

1. Clean and dust all machinery and equipment in your area.
2. Check and maintain accessories.
3. Report to area supervisor.

Assistants:

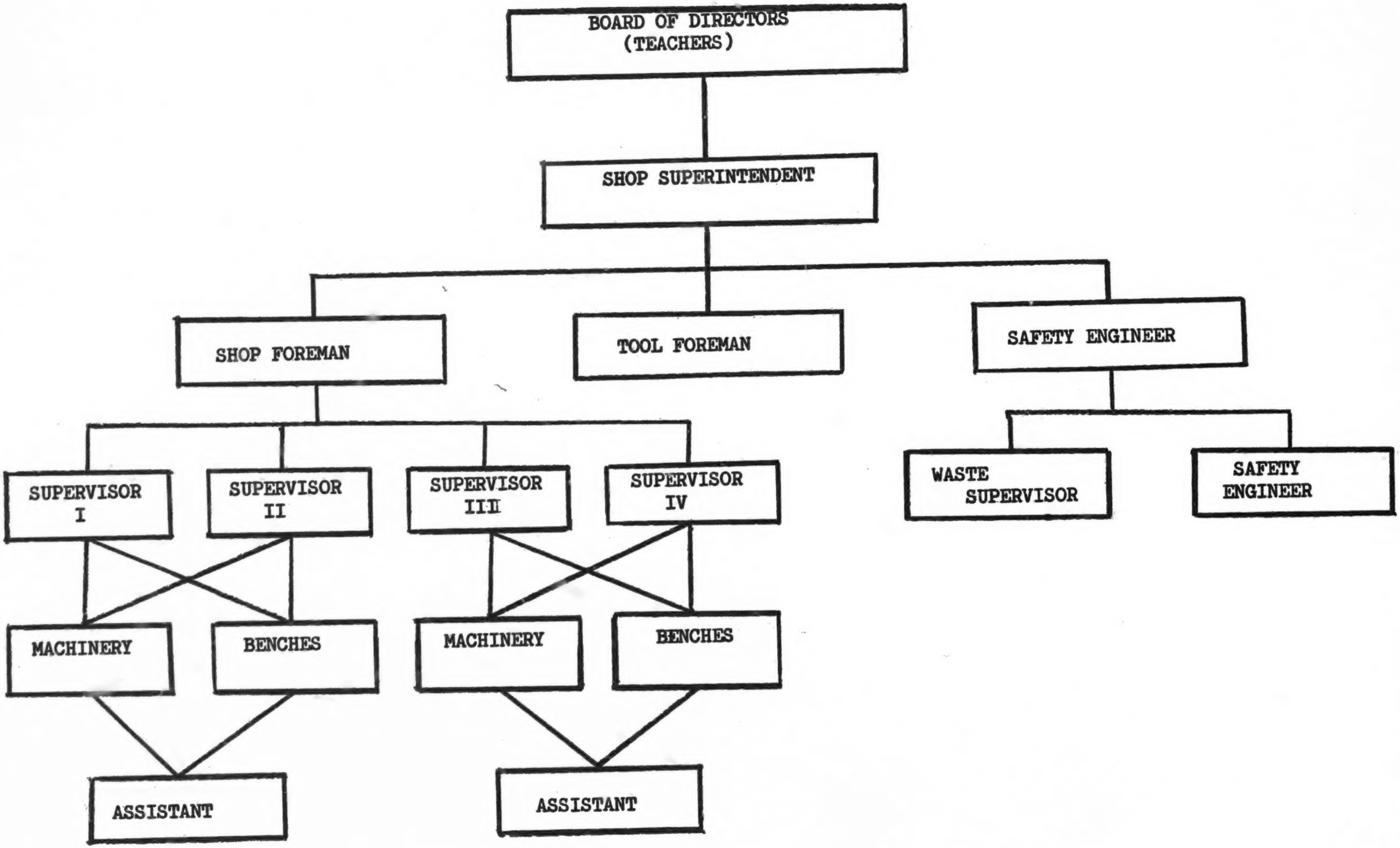
1. Take the place of absentees as directed by shop foreman.
2. Assist others when and if necessary.
3. Maintain sink and finish area.
4. Report to area supervisors.

Safety Equipment Supervisor:

1. Pass out aprons at beginning of period.
2. Collect and put away aprons at end of period.
3. Check safety shields to be sure they are at proper machines and in good order.
4. Report to Safety Engineer.

Waste Materials Supervisor:

1. See that all scrap or waste materials are disposed of.
2. Properly dispose of oily materials and finishing materials.
3. After floors are swept, place all scrap materials in waste receptacles.
4. Report to Safety Engineer.


BOARD OF DIRECTORS
(TEACHERS)
SHOP SUPERINTENDENT
SHOP FOREMAN
TOOL FOREMAN
SAFETY ENGINEER
SUPERVISOR I
SUPERVISOR II
SUPERVISOR III
SUPERVISOR IV
WASTE SUPERVISOR
SAFETY ENGINEER
MACHINERY
BENCHES
MACHINERY
BENCHES
ASSISTANT
ASSISTANT

Title: Simple Layout Tools and Procedures

Presentation:

I. Definition

A. Measuring and marking on material

II. Layout tools

A. Squares

1. Uses
a. Make a mark square with an edge
b. Laying out angles
2. Similarity of all squares
B. Bench rules
1. Uses
a. Measuring
b. Making straight lines
2. Circumference rule
a. For calculating circumference of a cylinder

C. Compass
1. Uses
a. Circles
b. Arcs
2. Similarity to dividers
a. Transfer

D. Marking instruments

1. Pencil
2. Scratch awl
3. Scriber

III. Laying out on any material

A. Similar process on any material

B. Need for accuracy

C. Surface protection

References:

Chris H. Groneman and John L. Feirer, *General Shop*, pp. 79-82, 169-173, 350-351.

Title: Simple Cutting Tools and Procedures

Presentation:

I. Definition

A. Separation of materials by wedge-shaped tools

II. Types

A. Drilling tools

1. The action of a single wedge in a rotary motion
2. Kinds
   a. Auger
      1) Wood
      2) ¼" to 1" diameter
   b. Automatic hand drill
      1) Wood
      2) 1/16" to ¼" diameter
   c. Portable electric drill
      1) Any material
      2) ¼", 3/8", ½" chuck capacities

B. Sawing tools

1. A series of wedges on a solid back
2. Kinds
   a. Coping saw
      1) Curved cutting
      2) Sheet materials except for ferrous metals
   b. Crosscut saw
      1) Straight cut across the grain
      2) Wood
   c. Hack saw
      1) Straight cutting
      2) Metals and other materials
   d. Scroll saw
      1) Curved and straight cutting
      2) Any material

C. Shearing tools

1. Two planes working against each other
2. Kinds
   a. Wood chisel
      1) Stock removal
      2) Wood, soft materials
   b. File
      1) Smoothing and stock removal
      2) Any material
   c. Tin snips
      1) Straight and curved cutting
      2) Thin sheet material

- d. Block plane
  - 1) Stock removal
  - 2) Wood, soft materials

References:

Chris H. Groneman and John L. Feirer, General Shop, pp. 178, 180, 83, 353, 192.

Title: Simple Forming Tools

Presentation:

I. Define forming tool

  A. A tool used to change the shape of material by bending

II. Kinds

  A. Round nose pliers

    1. Rolling wire into small circles

  B. Mallet

    1. Pounding material to shape without leaving hammer marks

  C. Ball peen hammer

    1. Shapes metal by making many small dents close together

  D. Hand seamer

  E. Stakes

    1. Different kinds

    2. Serves as mold for bending metal

  F. Bending brake

    1. Makes straight bends of various angles

  G. Slip roll former

    1. Shapes flat sheet metal into cylindrical shapes

References:

Chris H. Groneman and John L. Feirer, General Shop,
pp. 194-198-200.

Title: Simple Assembly Tools

Presentation:

I. Define assembly tools

  A. Tools used in the process of fastening individual parts together

II. Kinds

  A. Claw hammer

    1. Driving nails
    2. Pulling nails

  B. Nail set

    1. Sinking heads of nails below the surface of the wood

  C. Screwdriver

    1. Regular
      a. Used on regular single slot screws
    2. Phillips
      a. For cross slot screws
      b. Better gripping

References:

Chris H. Groneman and John L. Feirer, General Shop, pp. 112-113

Title: Simple Holding Tools

Presentation:

I. Define holding tool

- A. Any tool used either to clamp parts temporarily to make an operation easier or to hold another tool

II. Kinds

- A. Pliers
  - 1. Holds small parts to protect fingers and make handling easier
- B. Bit brace
  - 1. Used to hold bits
- C. Vise
  - 1. Wood
    - a. For woods or plastics
  - 2. Machinist
    - a. For metals
- D. Bench plate
  - 1. For holding metal forming stakes
- E. Hand clamps
  - 1. For quick jobs
  - 2. Variety of sizes
- F. C-clamp
  - 1. Variety of sizes
- G. Adjustable hand screw

References:

Chris H. Groneman and John L. Feirer, General Shop, p. 121.

Title: Finishing Materials and Methods
(Overview)

Presentation:

- I. Abrasives
  - A. Definition
    - 1. Coated papers or cloth or pumice stone used for cutting down finish surfaces
  - B. Common
    - 1. Sandpaper
    - 2. Garnet
    - 3. Steel wool
    - 4. Aluminum oxide
- II. Fillers
  - A. Definition
    - 1. A base preparation composed of silex, colors ground in oil and a grinding liquid or binder used to fill wood pores level preparatory to finishing
  - B. Hole and crack
  - C. Grain or pore filler
  - D. How to apply each
- III. Stains
  - A. Definition
    - 1. Classified as to spirit, oil or water-soluble dyestuff; term should not be used in connection with pigments which produce modified paints only
  - B. Oil
  - C. Water
  - D. Spirit
  - E. How to apply each

IV. Finishes

A. Definition

1. Material used to coat or cover surfaces to preserve or enhance the beauty of a material

B. Shellac

C. Varnish

D. Paint

1. Oil
2. Water

E. Enamel

F. Common rubbed finishes

1. Wax
2. Oil

V. Techniques

A. Definition

1. Method used in applying a finish

B. Brushing

C. Spraying

D. Rubbing

References:

John L. Feirer, Advanced Woodwork and Furniture Making, pp. 138-153.

Verne C. Fryklund, General Shop Woodworking.

S. W. Gibia, Wood Finishing and Refinishing.

Chris Groneman, General Woodworking, pp. 147-163.

Herman Hjorth, Basic Woodworking Processes, pp. 171-189.

Ira C. Madden, Woodworking for Industrial Arts, pp. 108-125.

Clifton Newell and William Holtrop, Coloring and Painting Wood.

Willis Wagner, Woodworking, pp. 51-63.

Ralph Waring, Modern Wood Finishing.

Title: Quality Control Procedures and Inspection

Presentation:

I. How many have heard the term "quality control?"

II. What is "quality control?"

- A. Assures the end product conforms with standards
  - 1. Who sets standards in quality control?
    - a. Industry
      - 1) Buyers of materials
      - 2) Sellers of the product
      - 3) Workers
      - 4) Management
      - 5) Customers
    - b. School
      - 1) Teachers
      - 2) Pupils
      - 3) Parents
- B. Prevents defects in manufacturing
  - 1. Causes of poor quality
    - a. Defective machines
    - b. Defective tools
    - c. Defective materials
    - d. Poor workers
  - 2. Results of poor quality
    - a. Scrap
      - 1) Costly to produce
      - 2) Low selling price
    - b. Reworking into other products

III. Why is quality control important?

- A. To satisfy customers
- B. To satisfy the company
  - 1. More profits
  - 2. More efficiency
  - 3. Better reputation
  - 4. More sales
- C. To satisfy the workers
  - 1. To increase pride
  - 2. Increase skill
  - 3. Incentive pay
  - 4. Workers evaluation
    - a. Transparency on employee appraisal

IV. How are products tested for quality?

- A. Testing through senses
- B. Use of tools or equipment
- C. Laboratory tests
- D. Performance testing
- E. Transparency on control procedures

V. What are the stages of inspection?

- A. Industry
  1. Raw materials
  2. Designs
  3. Models
  4. First part
  5. Crucial stage
  6. Final product
- B. School products
  1. Designs
  2. Plans and sketches
  3. As pupils work
  4. Finished product
- C. How can school products be evaluated?
  1. Suggestions from pupils
  2. Transparency on product evaluation
     - a. Design
     - b. Planning
     - c. Difficulty
     - d. Use of tools
     - e. Materials
     - f. Construction
     - g. Appearance
     - h. Accuracy
     - i. Finish
     - j. Use of time
     - k. Own work
     - l. Attitude

References:

Harold Amrine, John Ritchey, and Oliver Hulley, Manufacturing Organization and Management, pp. 277-300.

Claude George, Management in Industry, pp. 22, 516-19, 526-41, 543-61.

Observation of various school laboratory evaluation sheets

Transparencies:
- Control Procedures
- Employee Appraisal
- Industrial Arts Product Evaluation Sheet

Title: Marketing Procedures

Presentation:

I. Pricing

A. Total cost

1. Sales expenses
    a. Salaries of salesmen
    b. Travel expenses
    c. Advertising
2. Administrative expenses
    a. Executive salaries
    b. Secretarial salaries
    c. Legal fees
3. Factory cost
    a. Overhead
        1) Sandpaper
        2) Paint
        3) Rent
        4) Heat
        5) Lights
    b. Prime cost
        1) Direct material
            a) Material that goes directly into the product
            b) Waste or scrap
        2) Direct labor
            a) Labor that goes directly into the product
            b) Does not include maintenance work

B. Use an example of the above process in figuring the cost of a selected product with the information from the cost analysis and process sheet

II. Packaging

A. For advertising value

B. For protection of the product

C. For convenience in handling

III. Sales

A. Advertising

1. Use of salesmen
2. Use of impersonnel media

B. Product service

IV. Distribution

A. To the consumer directly

B. To company-owned warehouses

C. To non-owned retail outlets

References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley, Manufacturing Organization and Management, pp. 317-323, 493, 502-508.

UNIT EVALUATION:

1. Observe students as they work to determine their proper use of tools, equipment and work habits in the laboratory.

2. Pupil-teacher evaluation of products.

3. Written objective test.

UNIT EVALUATION - HOUSEHOLD ACCESSORIES INDUSTRIES

True or False

Directions: Place a circle around T if the statement is true and around F if the statement is false. Read all questions carefully.

T F One of the most important things to consider in the selection of a product is having a need for it. (True)

T F When planning the product, it is necessary to consider how it will be used. (True)

T F Dimensions need not be placed on sketches of products because they are unnecessary. (False)

T F The Board of Directors of an industry is responsible to the Shop Superintendent. (False)

T F Poor quality in products could be caused by workers. (True)

T F The only time that industry inspects a product is when it is finished. (False)

T F School products made by pupils are often checked for accuracy after they are designed. (True)

T F A worker will produce better quality products if he takes pride in his work. (True)

T F Workers are rarely evaluated or checked after they begin working in an industry. (False)

T F When buying an item, its quality is one of the most important things to consider. (True)

T F The Safety Engineer is not important because safety rules are for beginners. (False)

T F It is more important for a worker to produce more products than it is for him to produce good products. (False)

T F Laying out a pattern on metal is entirely different from laying it out on any other sheet material. (False)

T F Accurate measurements are not important in laying out. (False)

T F In figuring the total cost of a product, waste or scrap stock is included as a direct material. (True)

T F A knowledge of the total cost of materials is necessary to establish the selling price of the product. (True)

Unit Evaluation - Household Accessories Industries (Continued)

T F It is necessary to analyze drawings or sketches of a product to know what materials you will need to manufacture it. (True)

T F The amount of time it takes to make a product is of little importance in determining what the selling price will be. (False)

T F A block plane is designed to shear material from aluminum, brass, and other soft metals. (False)

Multiple Choice

Directions: Each of the statements below is followed by several words or phrases. Select the phrase which will best complete the statement and place its letter in the blank provided.

___ Which one of the following is a cutting tool?
a. hammer
b. hack saw
c. mallet
d. screw driver

___ Which of the following is important in the design of a product?
a. appearance
b. use of a T-square
c. use of a framing square
d. size of the plans

___ Which one of the following is NOT included in the total cost of manufacturing a product?
a. direct material
b. direct labor
c. profit
d. overhead

___ If a company has good quality products which one of the following would NOT be true?
a. increased sales
b. unemployed workers
c. more profits
d. satisfied customers

___ Which of the following saws would be most desirable for cutting metal?
a. crosscut saw
b. hack saw
c. scroll saw
d. miter box

___ Which of the following would be a marketing function?
- a. Sales
- b. Engineering
- c. Production
- d. Quality control

___ Which one of the following is a common layout tool?
- a. File
- b. Saw
- c. Tin snip
- d. Bench rule

___ Which of the following is NOT figured in the overhead when pricing a product?
- a. Rent
- b. Heat
- c. Materials that go directly into the product
- d. Lights

___ Which of the following is necessary in planning for the product you will manufacture?
- a. Getting the materials for the product
- b. Listing logical items that explain the procedure to be followed in manufacturing the product
- c. Inspecting the material that will be needed for the product.
- d. Cut the material to the correct size for the product

___ Production planning would be related to which one of the following functions of industry?
- a. Personnel management
- b. Engineering
- c. Finance
- d. Marketing

___ A partnership:
- a. Is made up of only one person
- b. Sells stock to finance the industry
- c. Cannot be organized on a profit-making basis
- d. Is an association of two or more people owning a business

Completion

Directions: Answer the following statements as briefly as possible in the space provided.

When finishing softwoods which contain pitch, what should you do to seal it in and prevent it from bleeding through the finish?
(Apply a coat of shellac)

Define a household accessory.
(A device found in the home, not a necessity, but making life more comfortable and convenient.)

Unit Evaluation - Household Accessories Industries (Continued)

Name one local Household Accessories Industry.

List four ways an industry uses its money.
(Answer any four correctly:

1. Supplies
2. Wages
3. Taxes
4. Tools
5. Dividend
6. Profit)

Directions: In the following list are common forming, assembly and holding tools. Classify each tool by placing the letter A, B, or C in the spaces provided.

A. Forming B. Assembly C. Holding

(C)	Pliers	(B)	Claw hammer
(A)	Mallet	(C)	Vise
(C)	C-clamp	(A)	Hand seamer
(B)	Phillips screwdriver	(C)	Bench plate
(A)	Ballpeen hammer	(A)	Slip roll former
(A)	Stakes	(C)	Adjustable hand screw
(B)	Nail set	(A)	Bending brake
(A)	Round nose pliers	(C)	Bit stock or brace

Name the three classes of stain. (Oil, water, spirit)

When staining, why is it necessary to test stains before applying them to a product? (Stains should be tested first so that one will be sure he has the desired color)

When finishing, how should the end grain of the wood be treated? (The end grain should have a coat of diluted shellac or turpentine applied so that it will not darken too much when the stain is applied.)

When staining a product, what should be stained first? (The underside of the project should be stained first, as this will not ordinarily be seen and also allows for a testing area)

Hardwoods or close grain woods should be sealed with (shellac) ?

What would be a good way for a manufacturer of paint to test his product? (Test through use)

Why should a laboratory be thoroughly cleaned at the end of each class? (Neatness, safety)

Unit Evaluation - Household Accessories Industries (Continued)

Matching

Directions: Place the number of the item on the right in front of the appropriate item on the left. More than one number may be placed in front of the items on the left. All nine of the items on the right must be used. One point for each item correctly placed on the left.

(4,7) Direct material

(3) Direct labor

(5,6) Overhead

(1,8) Sales expenses

(2,9) Administrative expenses

1. Advertising
2. Salaries of executives
3. Labor that goes directly into the product
4. Scrap or waste material
5. Rent
6. Light
7. Materials that go directly into the product
8. Salaries of salesmen
9. Secretarial salaries

TITLE OF UNIT

LAWN AND GARDEN ACCESSORIES INDUSTRIES

TEACHING TEAM

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NDEA INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

Industry - the instrument of society for the application of technology, has a continual affect on all individuals. In life as well as industry, the law of "survival of the fittest" applies. Most of us do not properly consider, or are aware of the affect of, the many fad items which appear on the market today and are gone tomorrow. This unit will be concerned with a study of those industries which must get their products on the market quickly.

The Lawn and Garden Accessories Industries introduce an area which is diversified and flexible, permitting as many directions or approaches as the imagination can pursue. It can be studied from custom or job production or from the concept of mass or continuous production. Products produced by these industries may be very elementary or involve very complicated construction.

As an industry which employs hundreds of thousands of people throughout the nation, particularly during the early spring and summer months, and because of the many novelty lawn and garden accessories which appear on the market in rapid succession to capture public appeal, these industries provide natural student appeal as they are made aware of competition and the problems of marketing a product quickly.

SCOPE:

This unit is designed for 8th grade boys and girls who have completed an introductory unit in manufacturing. It will serve the pupil and teacher as a short intensive unit to complete time requirements of an industrial arts course. Its intent is to provide flexibility so that the objectives can be achieved regardless of allotted time.

Unit emphasis will be on forming partnerships, meeting competition, and marketing a product quickly. Products shall be characteristic of the lawn and garden accessories industries and may be fabricated from a variety of available materials.

OBJECTIVE 1: To develop an understanding of an insight to the lawn and garden accessories industries and their place in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Identify local industries which manufacture lawn and garden accessories and recognize the effect of these on employment and the economy	1. a. List several local lawn and garden accessories industries	Local Lawn and Garden Accessories Industries and their Effect on Employment and the Economy
	b. Tour a local lawn and garden accessories industry	
	c. Look through the yellow pages for names of lawn and garden accessories industries	
	d. Look through local buyers guides for names of lawn and garden accessories industries	
	e. Look through catalogs for examples of products which are produced by lawn and garden accessories industries	

OBJECTIVE 1: To develop an understanding of an insight to the lawn and garden accessories industries and their place in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	1. f. Visit local stores and identify manufactured lawn and garden accessories	
	g. Plan a program for getting a product on the market quickly	
2. List the types of jobs or employment opportunities in the lawn and garden accessories industries.	2. a. Compare shop organization personnel with that of industry	
3. Explain the differences in types of ownership	3. a. Establish themselves in teams as partners in business	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Apply principles of design pertinent to products of these industries.	1. a. Look through appropriate catalogs for designs presently in use b. Identify design principles in sample accessories	
2. Follow logical procedure in selecting a product	2. a. Look through appropriate catalogs for product ideas b. Compare possible products c. Use criteria for production and marketing d. Use brainstorming session for selection of product	Crash Programming a New Product

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
3. Make working sketches or drawings of selected product	3. a. Sketch the proposed product b. Examine industrial sketches or drawings for content	
4. Analyze drawings or sketches for materials needed	4. a. Complete a cost analysis sheet	
5. Analyze drawings or sketches for procedures and/or construction details	5. a. Examine a process sheet used by industry b. Construct a flow chart for the manufacture of product	
6. Recognize and/or obtain the materials selected	6. a. Select materials for manufactured product	
7. Recognize and use simple layout tools and procedures	7. a. Locate layout tools in laboratory b. List simple layout tools	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	7. c. Use simple layout tools on selected product	
	d. Demonstrate use of layout tools to classmates	
8. Recognize and use simple tools and procedures	8. a. Locate cutting tools in laboratory	
	b. List simple cutting tools	
	c. Use simple cutting tools on selected product	
9. Recognize and use simple forming and shaping tools and procedures	9. a. Locate forming and shaping tools in the laboratory	
	b. List simple forming and shaping tools found on the manufacturing tool panel	
	c. Use simple forming and shaping tools on selected product	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
10. Recognize and use simple holding tools and procedures	10. a. Locate holding tools in the laboratory	
	b. Use simple holding tools on selected product	
11. Recognize and use simple assembly tools and procedures	11. a. Locate assembly tools on manufacturing panel	Simple Assembly Tools and Procedures
	b. List simple assembly tools	
	c. Use simple assembly tools on selected product	
	d. Conduct experiments on strength of fasteners	
	e. View film "The Factory"	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
12. Recognize and use simple finishing equipment and procedures	12. a. Locate finishing materials in the laboratory b. Prepare a list of common finishes for materials often used in these industries c. Use simple finishing materials nad techniques on selected product	Finishing Methods and Procedures
13. Inspect product and use suitable testing procedure	13. a. Evaluate manufactured product b. Compare industrial inspection techniques and relate to manufactured products c. Prepare an inspection form for use in laboratory d. Inspect mass-produced product for defects and function	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
14. Recognize packaging, labeling and distribution procedures	14. a. Package and label his product b. Display typical packaging materials from industry c. Visit local stores and observe packaging and labeling d. Discuss procedures used to get product to distribution centers or terminals e. Design label to attach to product f. Print label to attach to product	Marketing Procedure
15. Use pricing techniques to determine sale value of product	15. a. Determine the material costs of his product b. Estimate hours needed to produce product	

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils: 15. c. Estimate selling price of product d. Compare selling price with similar industry-produced products e. Develop cost pricing charts for laboratory use	

OBJECTIVE 3: To develop desirable attitudes and respect for work, the worker, and for the products of the Lawn and Garden accessories industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Work cooperatively with members of his class	1. a. Participate in the personnel organization	Included in all lessons where applicable
	b. Assist others in their tasks on production line	
	c. Follow policies for laboratory operation	
	d. Begin construction of several products for those who have not completed previous products	
2. Care for tools, equipment and facilities	2. a. Return tools to panel when finished with them	Included in all lessons where applicable
	b. Clean up work area	
	c. Participate in partnership organization	
3. Observe safety standards, posters, signs, and regulations	3. a. Observe safety signs on machines	Included in all lessons where applicable
	b. Wear proper safety clothing and use safety devices	

APPROACH:

1. Show samples of Lawn and Garden Accessories produced by industry.
2. Lead sales discussion on how we must produce a product to meet competition.
3. View film _The Factory_ to introduce line production in industry.

RESOURCE MATERIAL:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T., Ritchey, John A., and Hully, Oliver S., *Manufacturing Organization and Management*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966.

Bittle, Lester R., *What Every Supervisor Should Know*, New York: McGraw Hill Book Company, Inc., 1959.

Eisenberg, James and Kafka, Francis J., *Silk Screen Printing*, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1957.

Gergracht, Carl and Robinson, Frank E., *Understanding America's Industries*, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1962.

Industry Profiles, U. S. Department of Commerce Business and Defense Services Administration, 1958-1965.

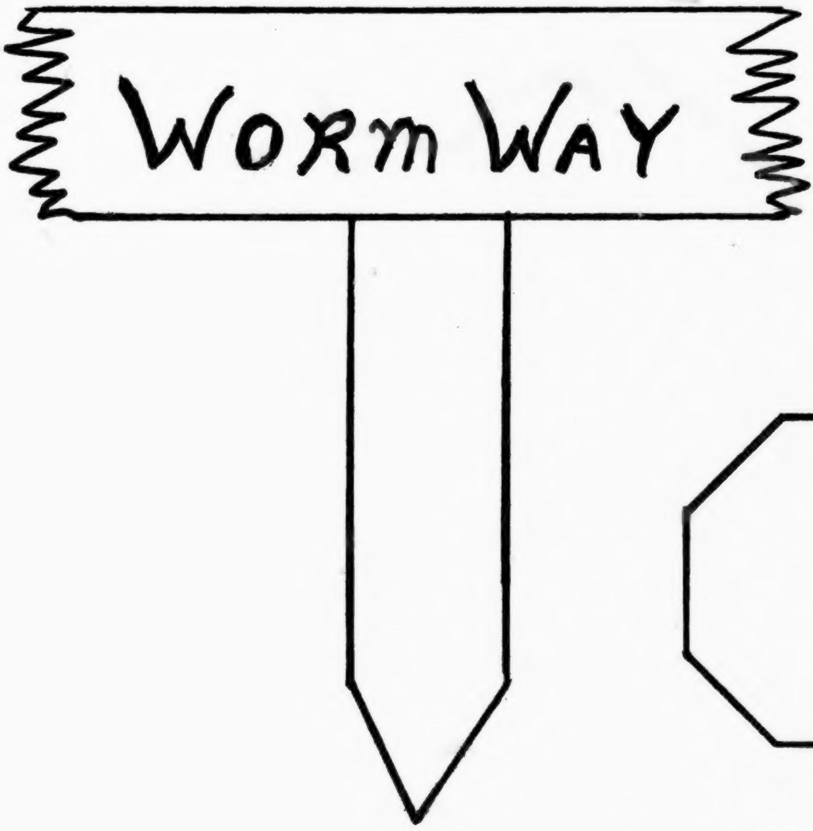
Keane, George R., *Teaching Industry Through Production*, Washington, D. C.: American Industrial Arts Association, 1963.

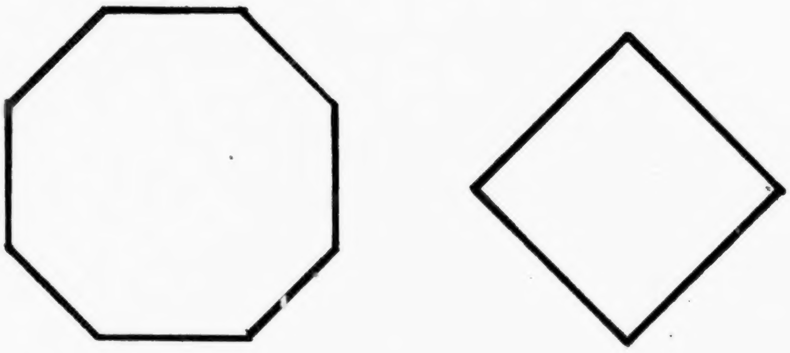
RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

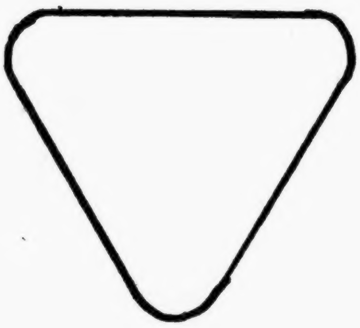
1. Sample of factory-produced sign
2. Samples of suggested designs and slogans
3. Assembly line flow chart
4. Film: The Factory, How a Product is Made. #11684 - University of Michigan Audio Visual Education Center, 720 E. Huron Street, Ann Arbor, Michigan. Cost: $6.50
5. Sample School Products, Inc. check
6. Sample label

SAMPLE PATTERNS and SLOGANS

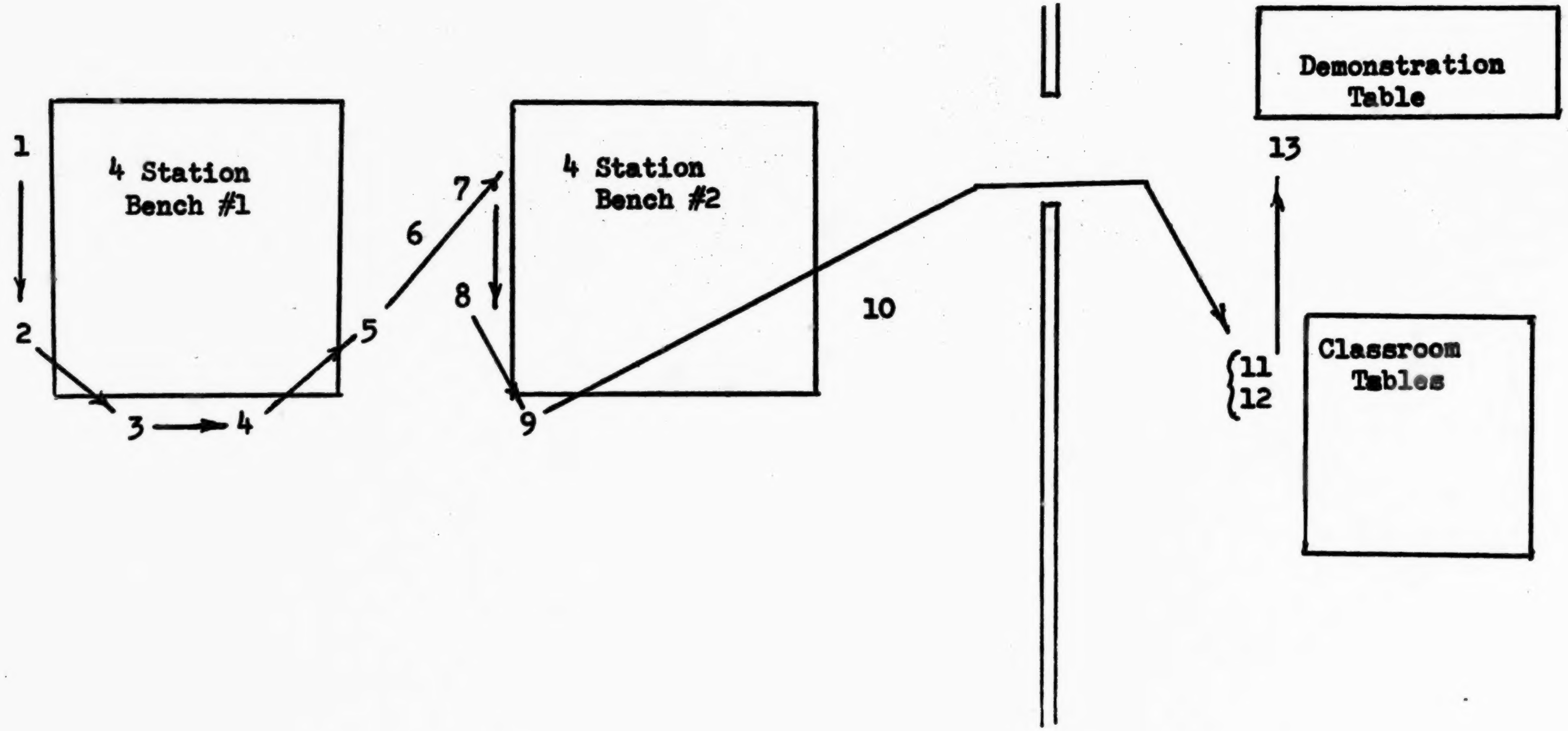




Alternate Sign Patterns



Deer path
Dear crossing
Worm crossing
Chicken path
Pig crossing
Bear path
Horse trail
People path
Worm Way
Chipmunk crossing
Bare crossing
Foot path
Tramp trale
Bear bridge
People patch
Womens way
Rite-of-way
Crosscut
Main-e-ac Crossin


4 Station Bench #1
4 Station Bench #2
Demonstration Table
Classroom Tables
1
2
3
4
5
6
7
8
9
10
11
12
13

1. Place sign and stake together
2. Place glue onto stake
3. Place sign and stake into fixture
4. Staple stake onto sign
5. Set staples and Inspection
6. Transfer signs to bench #2
7. Wrap advertising material around stake
8. Staple advertising sheet together
9. Inspection
10. Transfer to classroom tables
11. } Pricing
12. }
13. Arrange into groups and prepare for sale

ASSEMBLY LINE FLOW CHART FOR LAWN SIGNS

PAY PERIOD ENDING ______________ 19 ____

DATE ____________ 19 ____

SOC. SEC. NO. ____________________

NAME

REGULAR EARNINGS			
OVERTIME EARNINGS			
GROSS EARNINGS			
F. I. C. A.			EMPLOYEE'S STATEMENT OF EARNINGS AND DEDUCTIONS
WITHHOLDING TAX			
			DETACH BEFORE CASHING CHECK
TOTAL DEDUCTIONS →			
AMOUNT THIS CHECK			

SCHOOL PRODUCTS, INC.

No.

52-69
3214

________________ 19 ____

PAY TO THE ORDER OF ______________________________________ $ __________

____ DOLLARS

SAMPLE — NOT VALID

THE FIRST NATIONAL BANK

____

⑆3214⑈0069⑆ 987⑈654 3⑈

LEPRECHAUN TRAIL BLAZERS

by school products, inc.

Leprechaun trails are
very rare.
When you find one
Imbed a Trail-
Blazer there-
use care

by school products, inc.

TOOLS AND EQUIPMENT:

1. Silk screen equipment
2. Staple gun
3. Platen press and type
4. Dipping tray
5. Drying rack
6. 16mm projector and screen

MATERIALS AND SUPPLIES:

1. Pine
   1/4" x 1" - assorted lengths
   1/4" x 2" - " "
2. Paper for labels
3. Silk screen enamel
4. Exterior varnish
5. Staples, 9/16"

LESSONS TO BE TAUGHT:

- Local Lawn and Garden Accessories Industries and their Effect on Employment and Economy
- Crash Programming a Product
- Simple Assembly Tools and Procedures
- Finishing Methods and Procedures
- Marketing Procedures

Title: Local Lawn and Garden Accessories Industries and their
Effect on Employment and Economy

Presentation:

I. Define the term "Lawn and Garden Accessory."

  A. An item to add to the lawn or garden for convenience, comfort or decoration.

II. Local industries

  A. Effect on employment

    1. Varies with location
    2. Seasonal employment

  B. Effect on economy

    1. Seasonal effect

III. National industries

  A. Employment

    1. Employs several hundred thousand people

  B. Economy

    1. Payroll about $672.544 per year

IV. Competition

  A. Define

    1. Rivalry, the struggle to maintain or obtain an advantage over another person or company

  B. Effect of competition on industry

    1. Industries copy ideas of others
      a. Patent rights
        1) Define
          a) A right granted by the government to protect an item from being copied by others
            (1) Avoid by changing the design slightly
    2. Cornering the market
      a. Define
        1) A company getting to be sole producer of an item

References:

U. S. Department of Commerce, Industry Profiles, 1958-1965.

Title: Crash Programming a Product

Presentation:

- I. Routine for planning a crash program of a new product
  - A. Define "crash program"
    - 1. An all out effort to get a product on the market as rapidly as possible
  - B. To take advantage of selling a "fad" item
  - C. Forming an idea
    - 1. Copy from others, changing designs slightly
    - 2. From individual research
  - D. Engineering a product
    - 1. Study for improvements
    - 2. Change to avoid others' patent rights
  - E. Engineering manufacturing
    - 1. Choose best material
      - a. Fastest to fabricate
      - b. Cheap to fabricate
      - c. Durable for the expected length of the fad
    - 2. Route production
      - a. Fastest method
      - b. Easiest method

References:

Lester R. Bittle, What Every Supervisor Should Know, pp. 124-148.

Title: Simple Assembly Tools and Procedures

Presentation:

I. Assembly procedure

   A. Method used

      1. Assembly line
         a. Define
            1) A method of assembly where each worker completes only one operation in the construction of a product
         b. Typical operations
            1) Gathering materials together
            2) Placing parts into fixtures
               a) Define fixture
                  (1) A device used to hold materials in a given position
            3) Inspection
            4) Assembly of parts
            5) Transferring to specific laboratory areas for further assembly
            6) Packaging
               a) Method used
                  (1) Paper giving sales slogan and product name
            7) Pricing
               a) Estimation of materials used
               b) Estimation of hours worked
               c) Determine profit desired
               d) Final selling price
            8) Preparation of product for final sale

II. Assembly tools

   A. Meaning of assembly

      1. Placing the part of the product together

   B. Methods used

      1. Glue
         a. Reason for using
            1) To give added strength to staples
      2. Staples
         a. Reason for using
            1) Ease of operation
            2) Quick to apply
            3) Sufficient strength when used with glue
         b. Methods of using staples
            1) Power staple gun
            2) Hand desk stapler

III. Exact procedure of assembly for lawn signs

A. Method described in flow chart on following page

References:

Carl Gerbracht and Frank Robinson, *Understanding America's Industries*, p. 223.

Geroge R. Keane, *Teaching Industry Through Production*, pp. 17-23.

Title: Finishing Materials and Methods

Presentation:

I. Dipping

A. Definition

1. The process of immersing a product into a bath of the finishing material which serves to coat the product

B. Selection of finish

1. Lacquer
2. Shellac
3. Creosote
4. Varnish
    a. Cutting
        1) Definition - thinning the varnish with turpentine to give it the required consistency
        2) 50% diluted
            a) Advantages
                (1) Quick
                (2) Easy
                (3) Even coating
            b) Disadvantages
                (1) Wastes material
                (2) Finish buildup on lower edges
        3) 25% diluted
            a) Advantages
                (1) Thin, many coats
            b) Disadvantages
                (1) Dries quickly
                (2) Seals pores

II. Silk screening

A. Define

1. A stencil method of printing, using a fine porous fabric stretched tightly across a frame
2. Similarity to paper stencil

B. Ink

1. Type
2. Drying time
3. Colors

C. Squeegee

1. Sizes
2. Cleaning

D. Screen

1. Made from silk
2. Cleaned
3. Mounting
    a. Frame
    b. Hinge

E. Process

1. Ink screen
2. Insert material to be printed
3. Pull squeegee over screen
4. Lift top
5. Remove product

References:

James Eisenberg and Francis Kafka, Silk Screen Printing, Scan

Title: Marketing

Presentation:

- I. Functions of Marketing
  - A. Market research
  - B. Advertising
  - C. Sales promotion
  - D. Sales planning
  - E. Sales operations
  - F. Physical distribution
  - G. Pricing
  - H. Packaging
    - 1. Definition
      - a. Preparation of the final product for shipment and/or sale
    - 2. Purpose
      - a. Protection
      - b. Advertising
    - 3. Types
      - a. Plastic bag
      - b. Boxes
      - c. Wrapping paper
      - d. Cards
      - e. Wrap-around tag
    - 4. Selection of package design
      - a. Name of product
        - 1) Slogans to correspond to this name
      - b. Shape of product
        - 1) Determines type of package
        - 2) Determines how package will be attached
    - 5. Production of package
      - a. Cut paper stock to correct size
      - b. Print trade-mark of company
      - c. Set type for advertising on label
      - d. Students print labels
      - e. Attach label to product

References:

Harold T. Amrine, John A. Ritchey, and Oliver S. Hulley, Manufacturing Organization and Management, pp. 176, 495-509

UNIT EVALUATION:

1. Observe students as they work to determine their proper use of tools, equipment and work habits in the laboratory.
2. Written objective test.
3. Evaluation of line production techniques.
4. Comparison of custom and line production product costs.

UNIT EVALUATION - LAWN AND GARDEN ACCESSORIES INDUSTRIES

True or False

Directions: Place a circle around T if the statement is true and around F if the statement is false. Read all questions carefully.

T F Packaging can be defined as the preparation of the final product for shipment and/or sale. (True)

T F The package design is important to the sales of a product. (True)

T F Dipping is a finishing process. (True)

T F Lacquer is a suitable dipping material for an outdoor sign. (False)

T F Shellac is an animal product. (True)

T F Creosote is an excellent preserver. (True)

T F Varnish is a color pigment. (False)

T F Silk screening is a process similar to stenciling. (True)

T F Silk screening is done best using an enamel paint. (False)

T F Silk screening can be done in only one color. (False)

T F The squeegee is the name of the tool used to stretch the silk screen on the frame. (False)

T F An assembly line is where each worker builds a complete product. (False)

T F A fixture is used to hold parts during the assembly operation. (True)

T F Inspection is necessary to be sure that the product is of good quality. (True)

T F Some workers are used to move products from place to place on the assembly line. (True)

T F Mass production is one of the most expensive methods to produce a product. (False)

T F Stapling is a very unsatisfactory assembly method. (False)

T F Assembly is the layout of the parts onto materials. (False)

T F Glue is used to give added strength to the product. (True)

T F Another term for competition could be rivalry. (True)

T F A patent right is granted by an industry to protect designs from being copied. (False)

Multiple Choice

Directions: Each of the statements below is followed by several words or phrases. Select the phrase which will best complete the statement and place its letter in the blank provided.

___ Dipping is a process of (b)
- a. grinding
- b. finishing
- c. polishing
- d. silk screening

___ Lacquer has which of the following characteristics: (c)
- a. Durable when exposed to weather
- b. Has a very opaque color
- c. Very clear
- d. Easy to apply

___ Which one of the following is NOT a purpose of a package? (b)
- a. Protect the product
- b. Give more people work
- c. Help advertise the product
- d. Look nice for more sales appeal

___ Which of the following (is) (are) true of shellac? (a, b, c)
- a. Discolors very easily
- b. Resins or pitch will not bleed through
- c. Relatively inexpensive
- d. Withstands weathering very well

___ Creosote is used for (a, b)
- a. A preservative
- b. Paint
- c. Staining
- d. Cleaning

___ Varnish is a good finish because it (a, d)
- a. Is easy to apply
- b. Dries rapidly and dust-free
- c. Does not require a clean brush
- d. Is very hard and durable

Completion

Directions: Answer the following statement as briefly as possible in the space provided.

What is meant by the term "cornering" a market?
(Being the sole producer of a product)

What is a lawn and garden accessory?
(Adds convenience, comfort or decoration to lawn or garden)

Define the silk screening process.
(A stencil method of printing, using a fine, porous fabric stretched tightly across a frame)

Define the dipping process giving the advantages and disadvantages.
(The dipping process is a method of finishing a product by immersing in a bath of the finishing material which gives it a coating of the material. The advantages are that it is a very quick and easy process. It gives a very even coating. The disadvantage is that it wastes a lot of material and the finish build-up on the lower edges.

List 5 different types or kinds of packages.
1.
2.
3.
4.
5.

The ________ process is similar to stenciling. (silk screening)

______________ is used for cleaning the silk screening equipment.
(mineral spirits)

_______ and _____ are used as the fabric for silk screening.
(taffeta and organdy)

The best clear finish for an outdoor sign is ______. (varnish)

The material best suited for a wood preservative is _____. (creosote)

To cut a finishing material means to _________. (thin)

TITLE OF UNIT

INTRODUCTION TO TECHNOLOGY AND INDUSTRIAL ARTS

TEACHING TEAM

GARDNER SHERMAN
HERALD KLIEWER
KENNETH WASSON
CHARLES FERDEN
CHARLES PADDOCK

NDEA INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

Today we live in an amazing and fascinating world full of literally thousands of gadgets and products which are the results of our ever-increasing and ever-changing technology, ranging in all degrees of complexity.

This technology is inherent in food we eat, the clothes we wear, the homes we live in, the way we travel and communicate and the way we spend our leisure hours.

It should be the role of the school, then, to provide youth with such understandings of this technology and its prime user, "industry," so that he may better find his role as a producer and consumer of its fruits.

Industrial arts as a curriculum area is ideally suited to reflect the spirit of this technology: the significance and application of research, the inventiveness and creativity of man and his technical problem-solving skills, and the interplay of human relations. This introductory unit will help reveal to the pupils the wonders and scope of technology and how they may become a part of its evolution.

SCOPE:

This unit may be used as an introduction to industrial arts and the laboratory. It is designed for youngsters who have not experienced industrial arts and should not exceed one week.

OBJECTIVE 1: To develop an understanding of industrial arts, its purpose and relationship to industry and technology

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupil will be able to:	Have pupils:	
1. Recognize the role and objectives of industrial arts in education	1. a. Fill out interest form b. Discuss education and its purpose	Introduction to Industrial Arts and Technology
2. Relate the importance of industry and technology to society	2. Discuss the role of technology in society	
3. Explain the history and development of civilization and how tools affected technological development	3. a. Discuss the development of tools b. Prepare an exhibit of tools c. Make identification tags to develop custom production concept	Technology and Its Effect on the History and Development of Civilization

OBJECTIVE 2: To develop desirable attitudes toward the organization and procedure in the industrial arts laboratory

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupil will be able to:	Have pupils:	
1. Recognize the importance of safety to himself and those around him	1. a. Observe safety devices and regulations	General Safety in the Laboratory
	b. Point out safety on laboratory tour	
2. Assume responsibility	2. a. Return tools and equipment to proper place	
	b. Clean up after their work	

APPROACH:

1. Welcome students to the laboratory.
2. Have students complete interest inventory.
3. Take students on laboratory tour and demonstrate briefly
    a. Evolution of drill
        1) flintstone
        2) early bow drill
        3) electric drill
    b. Wood lathe
    c. Metal lathe
    d. Honajector
    e. Jointer
    f. Thickness planer
    g. Belt sander
    h. Scroll saw
    i. Band saw

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

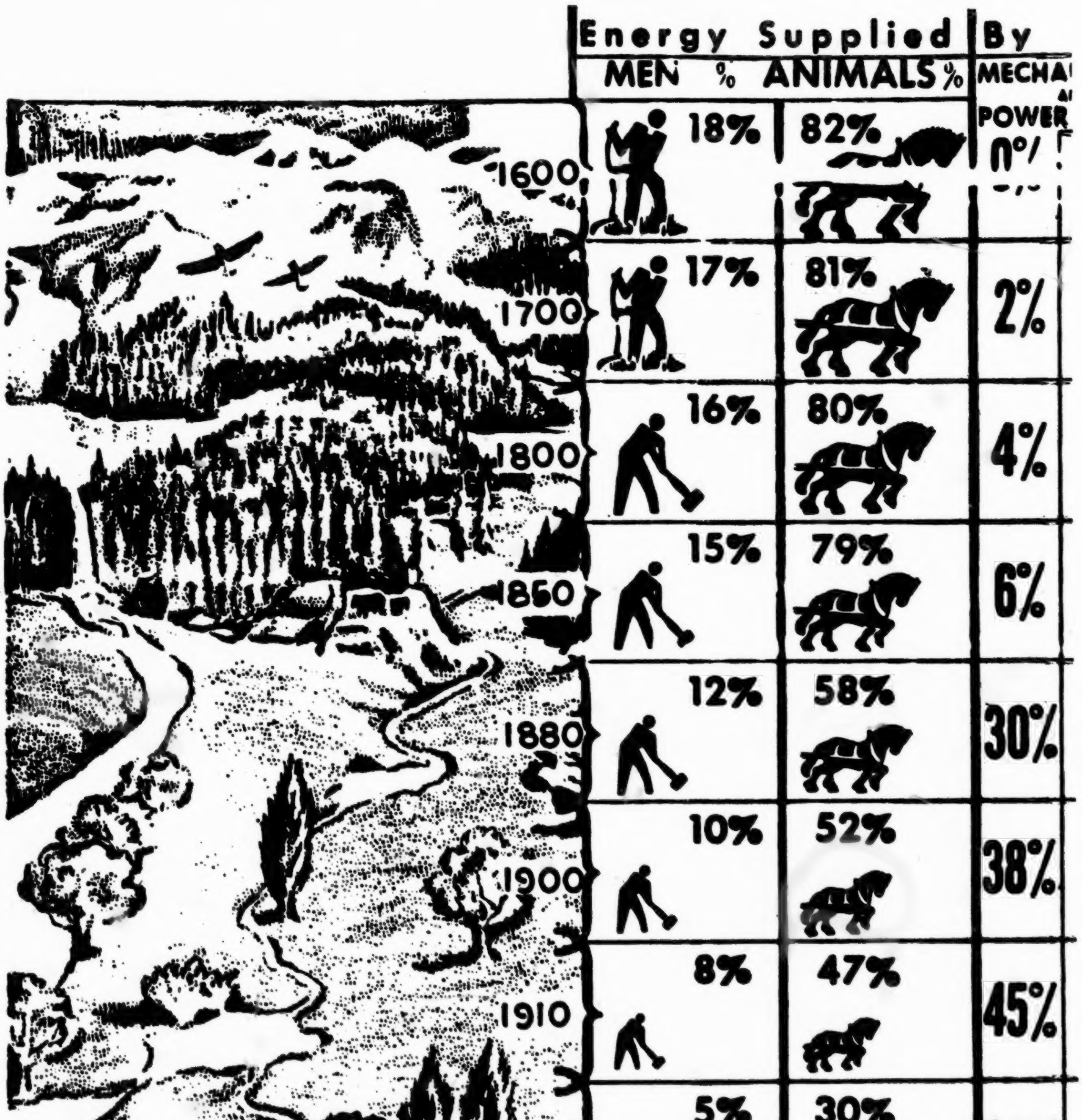
Bureau of Vocational Education, *Industrial Arts Technology*, Augusta, Maine: Department of Education, 1963.

Gerbracht, Carl and Robinson, Frank, *Understanding America's Industries*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963.

Olson, Delmar W., *Industrial Arts and Technology*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963.

RESOURCE MATERIALS:

- B. TEACHING AIDS OR DEVICES
  1. Charts
     a. Productivity Creates All Economic Growth, DoAll Corporation, 254 North Laurel Avenue, Des Plaines, Illinois, (Price $1.00)
     b. Why Living Improves in America, (same source as above)
  2. Transparencies
     a. Sections of Chart b
     b. Stages of American Technology
  3. Models and specimens
     a. Bow drill
     b. Bit brace
     c. Cut-away of small engine
     d. Others readily available



	MEN %	ANIMALS %	MECHA POWER
1600	18%	82%	0%
1700	17%	81%	2%
1800	16%	80%	4%
1850	15%	79%	6%
1880	12%	58%	30%
1900	10%	52%	38%
1910	8%	47%	45%
1920	5%	30%	65%
1930	4%	12%	84%
1940	4%	10%	86%
1950	4%	4%	92%
1960	3%	1%	96%

Energy supplied by men and animals has reduced over the years, because of the development of tools and power.

Adapted from:- Chart (Why Living Improves in America), DoAll Corporation, 254 North Laurel Avenue, Des Plains, Illinois, (Price $1.00)

STAGES OF AMERICAN TECHNOLOGY

Period	Stage	Power	Materials	Process	Work
1608	Handcraft	Muscle: Man, Animal	Wood, Iron, Bronze, Clay, Glass	Hand, Hand Tool	The Craftsman makes the complete product
1800	Machine	Wind, water, Electric motor, combustion engine	Steel, alloys, aluminum	Machine tool	Craftsman specializes in job operations Inventors
1900	Power	Portable internal combustion engine		Mechanization, mass production	The Craftsman becomes a machine operator
1915	Production	Portable electric motor		Assembly line, automatic machines, electric, hydraulic, pneumatic controls	Assembly Man Need for Engineers
1940	Research		Synthetics, plastics, man-made elements		Scientist Researcher
1952	Automation	Miniaturization	High refractory metals, ceramics, plastics	Electronic controls	Human Engineering Technician Servicing
1960	Nuclear-Space	Atomic, Solar	New materials for special purposes	Automated factories	The technician and service worker specialize

Delmar Olson, Industrial Arts and Technology, p. 46.

INTEREST INVENTORY

I. Your Family

Student Number____

Your name______________________________ Age (last birthday)____

Your street address________________________ Home phone________

Your father's name (or male guardian)____________________________

Place your father works______________________ Bus. phone________

Your mother's name (or female guardian)__________________________

Place your mother works______________________ Bus. phone________

Number of other children in family living at home_______________

II. Your Education

Approximate grade average in the last two years in school________

Classes you like most____

Classes you like least____

Why did you decide to take this class?_________________________

____

What would you like to build in the laboratory?________________

____

III. Your Interests

What is your hobby?____

What clubs do you belong to?___________________________________

What kind of offices have you held?____________________________

What kind of books do you like to read?________________________

What magazines do you read?____________________________________

IV. Your Future

What kind of program would you like to take when you get to high school: college preparatory, business, technical/vocational or vocational?____

What kind of work would you like to do as a vocation?___________

____

Have you talked to anyone in this occupation?__________________

If so, who?____

TOOLS AND EQUIPMENT:

1. Dymo tape writer
2. Hermes engraver
3. Honajector
4. Overhead projector
5. Projection screen

MATERIALS AND SUPPLIES:

1. Scrap plastic, wood, and metal
2. Plastic spray finish
3. Pin backs
4. Airplane cement
5. Alphabet noodles

LESSONS TO BE TAUGHT:

- Introduction to Technology and Industrial Arts
- Technology and its Effect on the History and Development of Civilization
- General Safety in the Industrial Arts Laboratory

Title: Introduction to Technology and Industrial Arts

Presentation:

- I. Personnel and procedures of the laboratory of industry
  - A. Introduction of teacher and pupils
  - B. Interest inventory
  - C. Attendance
  - D. Locker assignments
  - E. Fire exits
  - F. Entrance procedure
  - G. Rest room
  - H. Clothing
- II. Role of industrial arts in general education, its purposes, relationship to technology, industry and industrial arts
  - A. Definition of terms
    - 1. Industry
    - 2. Technology
    - 3. Industrial arts
  - B. Technology in industry
  - C. Technology in our society
  - D. Technology in our own lives
  - E. Preparation in schools of young people to live in a technical society
- III. Expectations of industrial arts
  - A. Student opinion of industrial arts
  - B. Manufacturing
    - 1. Custom production
    - 2. Mass production

Reference:

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 2-4.

Title: Technology and its Effect on the History and Development of Civilization

Presentation:

I. Development of tools and machines

- A. Natural resources can't be effectively changed by man

- B. Man can't change his human energy
  - 1. Man is an animal
  - 2. Birds, fish and animals use their features for protection, find food and shelter
  - 3. Man can think and reason
    - a. Create tools and machines
    - b. Tools are extensions of man's hands and feet

- C. From 1608 to 1960, man has used less of his own energy, less animal power and more power and machinery
  - 1. 1608 - 18% human energy - 82% animal energy
  - 2. 1960 - 3% human energy - 1% animal energy

II. Specific development of drilling

- A. Flint stone

- B. Rolling flint stone drills in hands

- C. Bow drill

- D. Hand auger

- E. Wooden bit brace
  - 1. Craftsman made own tools
  - 2. Relate to mdoern bit brace

- F. Electric drill

- G. Drill press
  - 1. Multiple drills
  - 2. Tape, fluid, air and electronic control

H. Various types of drill bits developed

1. New types
    a. Screw mate
    b. Speed bore
2. Variations of twist drill
    a. Machine bit for wood
    b. C'bore and drill on single shaft

III. Ability of man to develop tools and machines is responsible for the development of civilization

A. Tools alone not responsible

1. Engineers
2. Management
3. Money
4. Salesman

B. Tools and machines necessary for above to function

C. Foreign countries still using methods of years ago

1. Water buffalo - plow in the rice paddies
2. Reason
    a. Limited development of tools and machines
    b. Limited manufacturing by industry

D. United States has 6% of world population, 76% of world automobiles

E. What is technology?

1. Applied science
2. Demand for new and better machines

IV. Stages of American technology by Olson

A. Changing need for tools and machines

1. Reasons
    a. Development of power source
    b. New materials
    c. Research
2. Results

B. Change in the role of the worker

1. Craftsman
2. Craftsman specialized
3. Machine operator
4. Assembly man
5. Researcher - engineer
6. Technician
7. Specializing technician and service worker

C. What next?

1. Robot
2. Computer controlled factories

V. Summary

A. Importance of tools and machines in the development of civilization

B. Technology has developed many new materials

1. No use without new tools and machines to develop new products
2. Better conditions for society

C. View chart on the development of tools

D. Students to bring in old tools for class to see

E. To obtain the greatest good for the greatest number of people, better and bigger tools must be invented and manufactured. We cannot produce more goods without better tools.

F. There is no solution to redistributing the same pie to feed more people. The pie must be made bigger or more pies produced.

Reference:

DoAll Corporation, Civilization Through Tools, Chart.

Title: General Safety in the Industrial Arts Laboratory

Presentation:

- I. Major causes of accidents
    - A. Carelessness and thoughtlessness
    - B. Not knowing how to do things
- II. Safety a habit
    - A. Become part of routine
    - B. Be recognized as important
    - C. Must be practiced
- III. Attitudes of safety
    - A. Safety is everyone's business
    - B. Always be careful
    - C. Follow the rules
    - D. Everyone try
    - E. Think
    - F. You are the key

References:

Carl Gerbracht and Frank E. Robinson, Understanding America's Industries, pp. 8-9.

UNIT EVALUATION:

Observe pupils as they work to determine if behavior has been affected.

TITLE OF UNIT

GAMES AND TOYS INDUSTRY

TEACHING TEAM

GARDNER SHERMAN
HERALD KLIEWER
KENNETH WASSON
CHARLES FERDEN
CHARLES PADDOCK

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

The manufacturing of games and toys has been growing at a tremendous rate. This rate of growth for the games and toys industry seems to come from technological advances... The American public continues to enjoy greater amounts of leisure time, thus enabling them to utilize more games and toys for recreational purposes. The growth of the games and toys industry is due in part to the desires and purchasing power of the American people.

With sales of approximately 1,48 billion dollars, the games and toys industry is a significant segment of the gross national product. The toy industry ranks 49th out of a total 61 leading industries. Economic prognosis indicates that population growth, personal income, and the increase of leisure time will continue to foster the expansion and growth of this segment of our economy.

With the ever-increasing emphasis on the space age, the toys and games industry introduced this era into its products, thus causing a totally new concept vivid to the imagination of the American public.

Youngsters and adults will always enjoy testing their skill through the use of individual and group games. A large variety of games and toys can be found on the counters and shelves of any department store.

These industries specialize in large-scale production of games and toys. Designers and manufacturers of games and toys capitalize on every factor that will attract the public. The products can be made from numerous types of materials, such as woods, plastics, metals, leathers, and paper. Design may very from the very simple to the more complex mechanical.

The investigation of this type of industry is an ideal starting place in the continuing study of the manufacturing industries. Most pupils at this level will be highly interested in the production of an item. Through use of local, natural materials and pupil desires, it will be possible to develop basic understandings and appreciations concerning the games and toys industries.

SCOPE:

The games and toys unit is appropriate for junior high school students. The unit should follow a unit in custom production in which students have had previous background in industrial arts.

The product will be limited to a marketable item within the facilities of the laboratory, utilizing mass production methods and techniques. Because of limited time and background of pupils, most of the jigs, fixtures, and machines for production work should be set up by the instructor.

OBJECTIVES:

1. To develop an understanding of the games and toys industry in our society.
2. To develop a degree of skill in the use of tools, machines and related processes in the games and toys industry.
3. To develop desirable attitudes toward work, the worker, and products of the games and toy industry.

OBJECTIVE 1: To develop an understanding of the games and toys industry in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The students will be able to:	Have pupils:	
1. Realize the importance of toys and games in the development of an individual	1. Discuss the role or purpose of a game or toys for all age levels	Toys and Games in Personal Development
2. Recognize the impact of the games and toys industries on our economy	2. a. List area industries that manufacture toys and games	The Place of the Games and Toys Industry in our Economy
	b. Survey number and kinds of toys and games in own home	
	c. Count the number of games and toys available to the public by looking in a catalog such as Sears or Wards	
3. Compare different types of ownership	3. a. Form a company	Ownership of Industrial Enterprise
	b. Buy stock in a company	
4. Explain mass production as a manufacturing technique	4. a. Observe film on mass production	Introduction to Mass Production
	b. Research history and development of mass production	

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes in the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Make a sketch from an idea	1. a. Sketch a simple drawing, using elements of design	Elements of Design
	b. Discuss value of a [illegible] sketch in engineering	
2. Select a product for manufacturing	2. a. Bring in ideas for a product in the form of sketches, sample or description using predetermined requirements	
	b. Discuss selection of a game or toy	
	c. Present their ideas to the class by acting as a salesman suggesting a new product to be manufactured	Selecting a Product to Manufacture
	d. Vote on the selection of product for manufacture	
	e. Present successful salesman with a bonus for product idea	

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes in the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
3. Make a working sketch or drawing	3. a. Prepare working sketch or drawing of selected product b. Examine an industrial drawing or print for general content or details	Make a Working Sketch
4. Analyze working sketch for materials	4. a. Examine selected product for single and multiple parts b. Determine quantity of material needed c. Complete bill of materials needed	Analyze Sketches for Materials Required
5. Analyze drawing for production processes	5. a. Construct a diagram to illustrate the flow of material b. Make engineering process sheet for the product	Process Engineering

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes in the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
6. Procure material for the product	6. a. Examine stock racks for types and sizes of materials	Selection of Stock
	b. Inspect material for defects	
	c. Get out stock with minimum waste	
7. Layout to finished sizes	7. a. Apply finished dimensions to material and machine	Using the Layout Tools
	b. Apply templates or patterns to material	
8. Cut finish sizes	8. a. Remove excess material with cutting tools and machines	How Cutting Tools Work
	b. Check the quality of finished cuts	

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes in the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
9. Shape material to final details	9. a. Bore holes with and without jig guides	How Cutting Tools Work
	b. Shape angles, bevels and chamfers	
	c. File shapes and edges	Using Jigs and Fixtures with Hand Tools and Machines
	d. Make joints and grooves in material	
10. Form to final shape	10. a. Bend sheet metals to desired form	Forming Tools and Equipment
11. Assemble manufactured parts	11. a. Discuss methods of assembly	How to Assemble Manufactured Parts
	b. Devise simple jigs to assemble parts	
	c. Apply suitable fastners to manufactured parts	

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes in the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
12. Prepare surfaces for finishing materials	12. a. Inspect surface condition for a specified finish b. Condition surfaces for quality desired	Surface Preparation for Finishing
13. Select and apply finishing materials	13. a. Experiment to find a suitable finishing material to protect and decorate the product b. Apply finishing material by a method suitable for the product	Available Finishes and Methods of Application
14. Inspect or test the finished product	14. a. Compare finished product to the sketches and prepared drawing b. Inspect the quality of the finish c. Test moveable parts for proper operation	Inspection Methods

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes in the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
15. Prepare the product for distribution	15. a. Package the product for protection b. Package the product to sell c. Attach company label and guarantee	Packaging a Product

OBJECTIVE 3: To develop desirable attitudes toward work, the worker, and products of the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
1. Recognize quality in products of the games and toys industry	1. a. Compare well-made products with inferior ones	Evaluating Products
	b. Criticize industrial products for consumer value	
	c. Perform inspection of parts	
2. Describe the organization and working conditions of a manufacturing industry	2. a. Set up work stations	Industrial Company Organization
	b. List job descriptions	
	c. Visit a manufacturing industry	
	d. Fill out industrial observation sheet	
3. Accept responsibility commensurate to his assigned post	3. a. Draw up production flow chart	Industrial Personnel and their Responsibilities

OBJECTIVE 3: To develop desirable attitudes toward work, the worker, and products of the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	3. b. Participate in the production line of the industry	
	c. Participate in maintenance clean-up	
	d. Explain particular responsibilities in company organization	
4. Recognize the role of organized labor and how it affects the worker	4. a. Report on conditions that can be improved in the Industrial Arts facility	Labor Organizations
	b. Make comparison of early industrial conditions to the present	
	c. Fill out job application	
	d. Set up grievance committee	

OBJECTIVE 3: To develop desirable attitudes toward work, the worker, and products of the games and toys industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
The pupils will be able to:	Have pupils:	
	4. e. Report on different types of laboratory organizations	
5. Realize the importance of individual and group safety	5. a. Participate in safety campaign in the laboratory b. Make posters and slogans on safety c. Wear safety equipment d. Observe safety instructions for individual operations	Safety in the Industrial Arts Laboratory (Specific safety instruction included in each lesson where applicable)

APPROACH:

Pupils will compare a custom and a mass produced product by observation of the product. A film will be presented, introducing the operation of a factory.

Pupils will define the terms, games and toys, and present to the class sketches of ideas that they have designed for possible production.

Final product selection will be determined on the basis of appeal to the general public, potential of sales on the market, and limitations of the laboratory facilities.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T; Ritchey, John A., and Hulley, Oliver S., *Manufacturing Organization and Management*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1966.

Association of Consulting Management Engineers, Inc., *Common Body of Knowledge for Management Consultants*, The Association, New York, 1957.

Bethel, Lawrence L.; Atwater, Franklin S.; Smith, George H. E.; Stackman, Harvey A., *Industrial Organization and Management*, McGraw-Hill Book Company, 1962.

Boyd, T. Gardner, *Metalworking*, Goodheart-Willcox, Homewood, Illinois, 1962.

Cain, Ethel and Hunt, Sarah Ethridge, *Games the World Around*, A. S. Barns and Company, New York, 1941.

Consumers Union, *Consumer Reports*, Mt. Vernon, New York, 1968.

Cook, Donald E., *Marvels of American Industries*, C. S. Hammond and Company, Maplewood, New Jersey, 1962.

Feirer, John L. and Lindbeck, John, *I. A. Metalwork*, Charles A. Bennett Company, Peoria, Illinois, 1965.

______________, *Industrial Arts Woodworking*, Charles A. Bennett Company, Inc., 1960.

______________, *Woodworking for Industry*, Charles A. Bennett Company, Inc., Peoria, Illinois, 1963.

French, Thomas E. and Carl L. Svensen, *Mechanical Drawing*, McGraw Hill Book Company, Inc., 1940.

Gerbracht, Carl; Robinson, Frank; and Hanks, William, *Understanding America's Industries*, McKnight and McKnight, Bloomington, Illinois, 1962.

Haws, Robert J. and Schaefer, Carl J., *Manufacturing in the School Shop*, American Technical Society, Chicago, Illinois, 1960.

Kettering, Charles Franklin; Orth, Allen, *American Battle for Abundance*, General Motors, Detroit, Michigan, 1962.

Klok, John, *Wood Production and Engineering*, Klok Institute, Grand Rapids, Michigan, 1949.

Ludwig, Oswald A., *Metalwork Technology and Practice*, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1947.

Olson, Delmar W., *Industrial Arts for the General Shop*, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1955.

______________, *Woods and Woodworking for I. A.*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1965.

Smith, Lavon B. and Maddox, Marion E., *Elements of American Industry,* McKnight and McKnight Publishing Company, Bloomington, Illinois, 1966.

Wagner, Willis H., *Woodworking*, Goodheart-Willcox, Homewood, Illinois, 1961.

Walker, John R.,*Modern Metalworking* Goodheart-Willcox, Homewood, Illinois, 1965.

Wilber, Gordon and Norman Pendered, *Industrial Arts in General Education*, International Textbook Company, Scranton, Pennsylvania, 1968.

RESOURCE MATERIALS:

B. TEACHING AIDS AND DEVICES

1. Films

   a. The Factory, How a Product is Made, #11684, University of Michigan Audio Visual Education Center, 720 E. Huron Street, Ann Arbor, Michigan. Cost: $6.50
   b. Technology and You, Audio-Visual Center, Bloomington, Indiana, $1.75 rental

2. Teaching aids

   a. Stock certificate
   b. Transparency - elements of design
   c. Information sheet - classified ads
   d. Job application form
   e. Corporate organization
   f. Cash flow chart
   g. Time card
   h. Assembly line flow chart
   i. Bill of material
   j. Job ticket
   k. Pictorial of product
   l. Assembly drawing
   m. Detail drawing of board
   n. Detail drawing of leg
   o. Stretch out of box
   p. Packaging label

NON-LEGAL
ONE SHARE
$1.00
PAR VALUE

Stock Certificate

NON-TRANSFERABLE
CERTIFICATE NUMBER

DATE ____________

This Certifies That

first name initial last name number street

city state or province zip code IS THE OWNER OF

ONE SHARE, PAR VALUE ONE DOLLAR, OF THE CAPITAL STOCK OF

IRISHWOOD INC.

SUBJECT TO INFORMATION ON THIS CERTIFICATE.

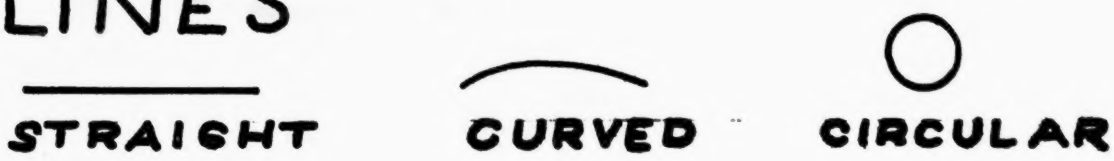
city state or province

company representative stockholder

STOCKHOLDER VOTES FOR ELECTION OF BOARD OF DIRECTORS

ELEMENTS OF DESIGN

LINES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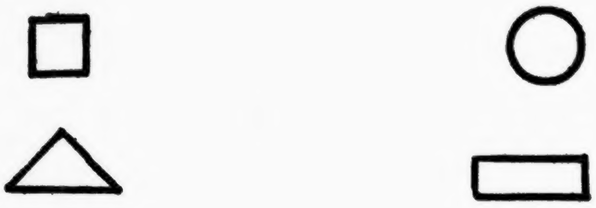


MASS

PROPORTION

GOLDEN RULE (1.618)
ODD RATIOS
MOST APPEALING
- RECTANGLES
- OVALS
- FREE FORMS

BALANCE

FORMAL
NON-FORMAL

COLOR

TEXTURE

CLASSIFIED ADVERTISING

------THE FOLLOWING JOBS AVAILABLE TO QUALIFIED PEOPLE IN NEWLY ORGANIZED GAMES AND TOYS INDUSTRY.

PLANT MANAGER

Responsible for the organization and management of plant. (Must be industrious and hard working)

V. P. FOR FINANCE

Responsible for the organization of the financial aspects of company. Primary concern will be determining material costs. (Must enjoy math)

ENGINEERING MANAGER

Major responsibility for the engineering of products from idea through production planning.

PRODUCT MANAGER

Responsible for the setting up of production, making product parts, assembly, and quality control of product.

PERSONNEL MANAGER

Responsible for the safety in the plant and for hiring of personnel.

VICE PRESIDENT MARKETING

Responsible for the advertising and selling of the manufactured product.

(JOB APPLICATIONS MAY BE OBTAINED FROM YOUR INSTRUCTORS)

IRISHWOOD, INCORPORATED

APPLICATION FOR EMPLOYMENT

Title of the job you are applying for________________________

Print your name in full__________________________________
(Last) (First) (Middle)

Qualifications_______________________________________

Reason for applying for this position________________________
(Use back of sheet if necessary)

Street Address____________________ Nearest telephone______

City______________ State________ S. S. Number__________

How long at this address_____ Wages expected \$_______________

Age____ Date of birth________________ Height___________
Month Day Year Feet Inches

Weight______ Sex_____ Hobbies__________________________

Sports interested in_____________________________________

Do you have any physical defects?__________________________

If so, what are they?____________________________________

How many days have you lost by illness in the past 2 years?______

Were you ever employed by this company before?_____ __________

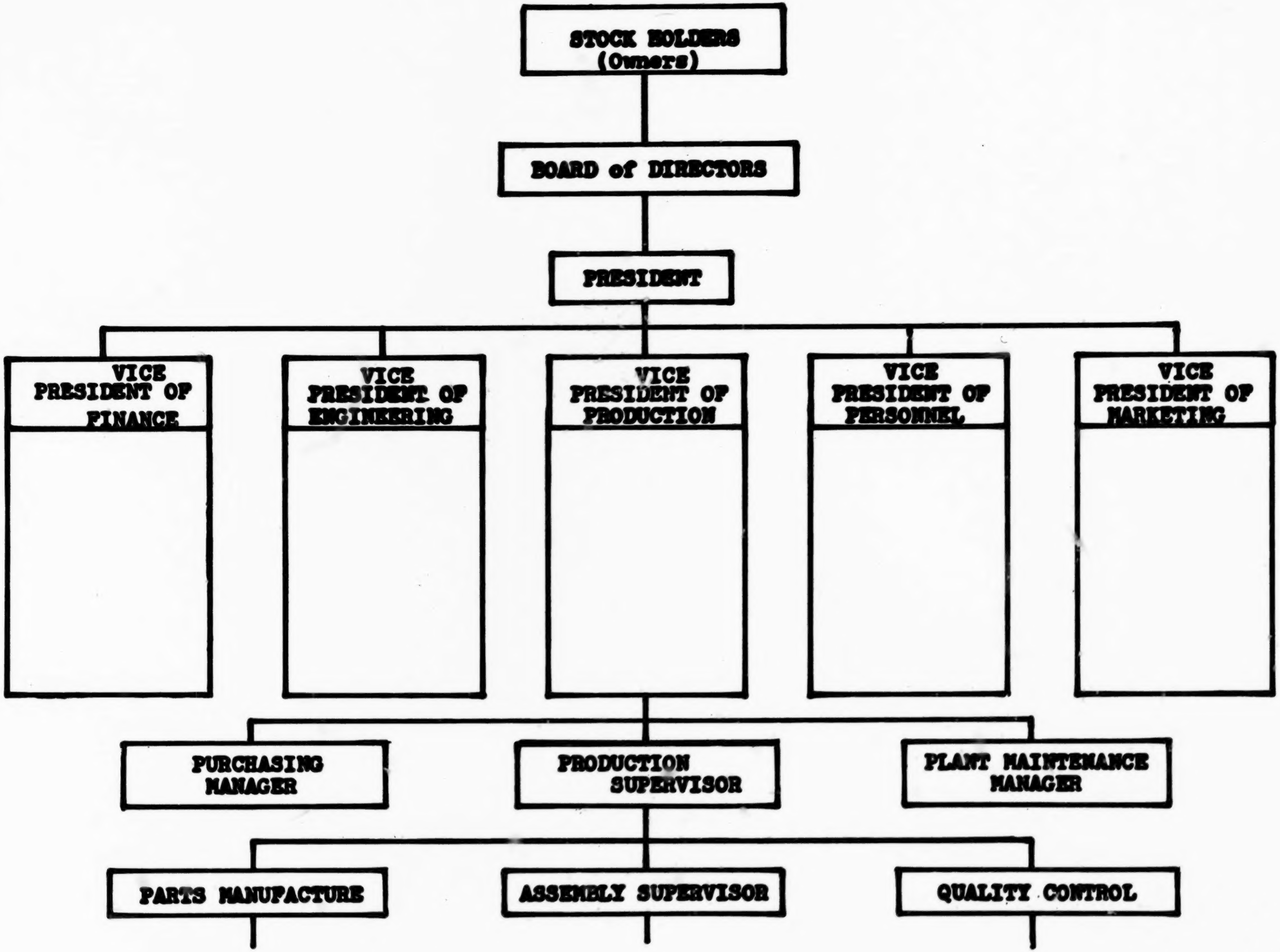
List some names of friends or relatives working here___________

____

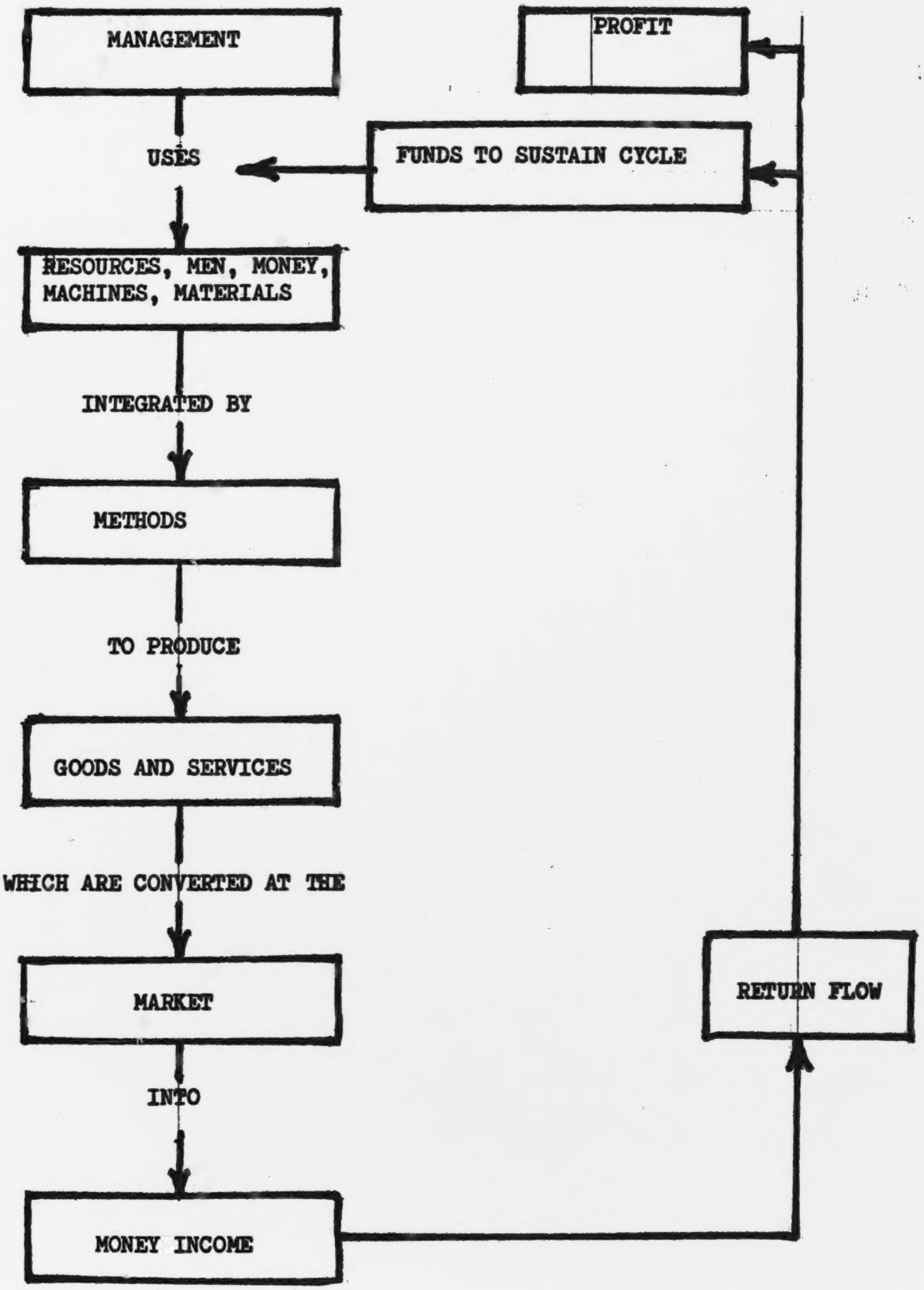
Education	Name of School	Location	Yrs. Attended	Years Comp.
Grammar School				
High School				
Other education or special training				

I declare and warrant that the answers made herein are correct and true and I am willing to undergo examination and to be fingerprinted.

(Date)________________ (Signed)______________________________


STOCK HOLDERS (Owners)
BOARD of DIRECTORS
PRESIDENT
VICE PRESIDENT OF FINANCE
VICE PRESIDENT OF ENGINEERING
VICE PRESIDENT OF PRODUCTION
VICE PRESIDENT OF PERSONNEL
VICE PRESIDENT OF MARKETING
PURCHASING MANAGER
PRODUCTION SUPERVISOR
PLANT MAINTENANCE MANAGER
PARTS MANUFACTURE
ASSEMBLY SUPERVISOR
QUALITY CONTROL

CASH FLOW CHART


MANAGEMENT
PROFIT
USES
FUNDS TO SUSTAIN CYCLE
RESOURCES, MEN, MONEY, MACHINES, MATERIALS
INTEGRATED BY
METHODS
TO PRODUCE
GOODS AND SERVICES
WHICH ARE CONVERTED AT THE
MARKET
RETURN FLOW
INTO
MONEY INCOME

NAME ____________________

STUDENT NUMBER ____________

	HR.	MIN.	DATE			TIME
TIME CARD					IN	
					OUT	
					IN	
					OUT	
					IN	
					OUT	
					IN	
					OUT	
					IN	
					OUT	
			TOTAL HOURS			

WEEK ENDING ____________

NDEA INSTITUTE

1968

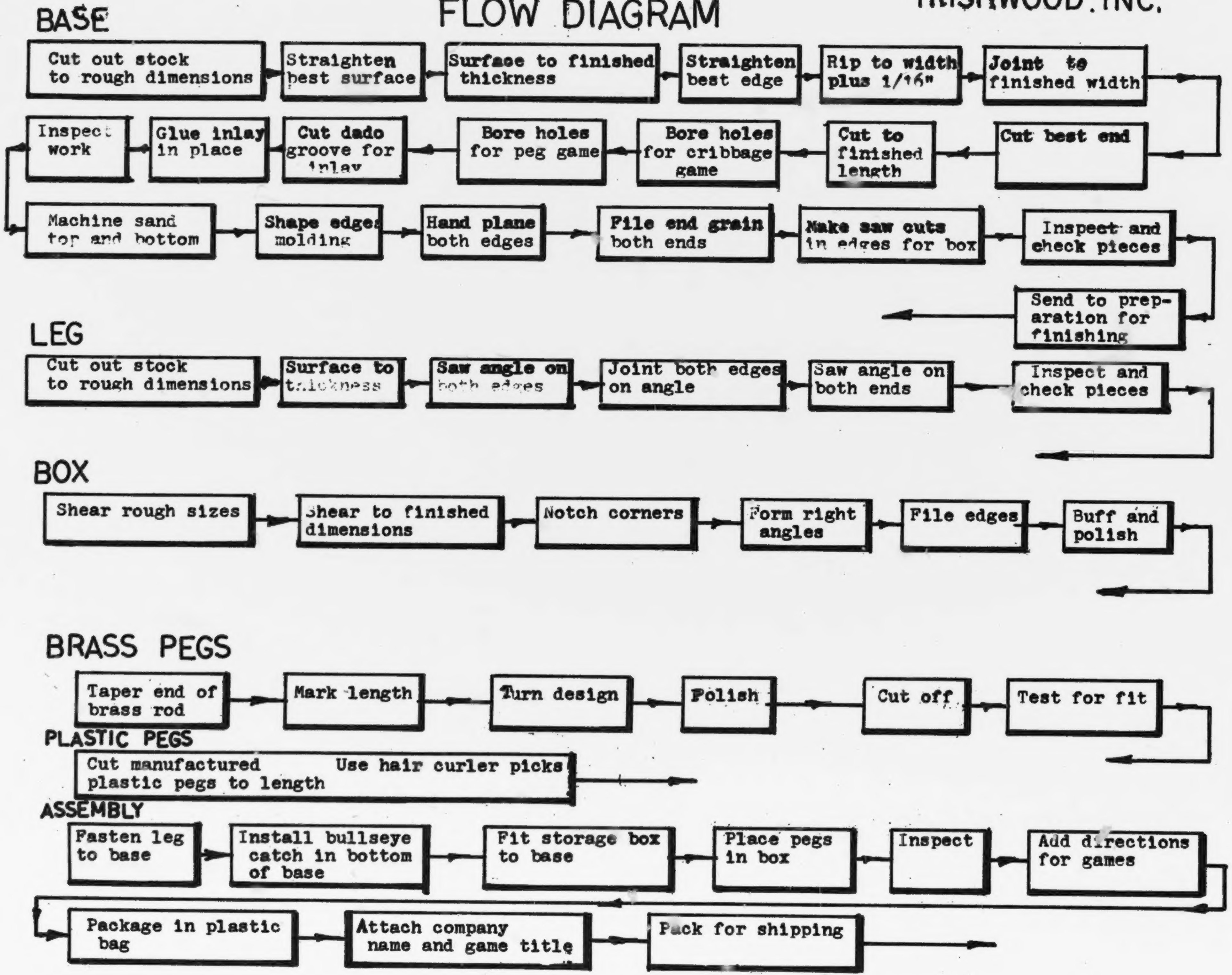
PRACTICUM

GORHAM STATE COLLEGE

GORHAM, MAINE

FLOW DIAGRAM

IRISHWOOD. INC.


BASE
Cut out stock to rough dimensions
Straighten best surface
Surface to finished thickness
Straighten best edge
Rip to width plus 1/16"
Joint to finished width
Cut best end
Cut to finished length
Bore holes for cribbage game
Bore holes for peg game
Cut dado groove for inlay
Glue inlay in place
Inspect work
Machine sand top and bottom
Shape edges molding
Hand plane both edges
File end grain both ends
Make saw cuts in edges for box
Inspect and check pieces
Send to preparation for finishing
LEG
Cut out stock to rough dimensions
Surface to thickness
Saw angle on both edges
Joint both edges on angle
Saw angle on both ends
Inspect and check pieces
BOX
Shear rough sizes
Shear to finished dimensions
Notch corners
Form right angles
File edges
Buff and polish
BRASS PEGS
Taper end of brass rod
Mark length
Turn design
Polish
Cut off
Test for fit
PLASTIC PEGS
Cut manufactured plastic pegs to length
Use hair curler picks
ASSEMBLY
Fasten leg to base
Install bullseye catch in bottom of base
Fit storage box to base
Place pegs in box
Inspect
Add directions for games
Package in plastic bag
Attach company name and game title
Pack for shipping

IRISHWOOD, INC.

PRODUCT____________ NO.____

PART NO.	NO. OF PIECES	NAME OF PART	FINISHED SIZE			KIND OF MATERIAL	ONE ROUGH MAKES	ROUGH SIZE			FOOT-AGE	PRICE PER UNIT	COST OF PART
			T	W	L			T	W	L			

TOTAL COST

NOTE ROUGH SIZE WIDTH = FINISHED WIDTH PLUS $\frac{1}{8}$"
" " LENGTH = " LENGTH " $\frac{1}{4}$"

PREPARED BY____________

IRISHWOOD, INC.

PRODUCT______________ NO.______
NAME OF PART______________
PART NUMBER______

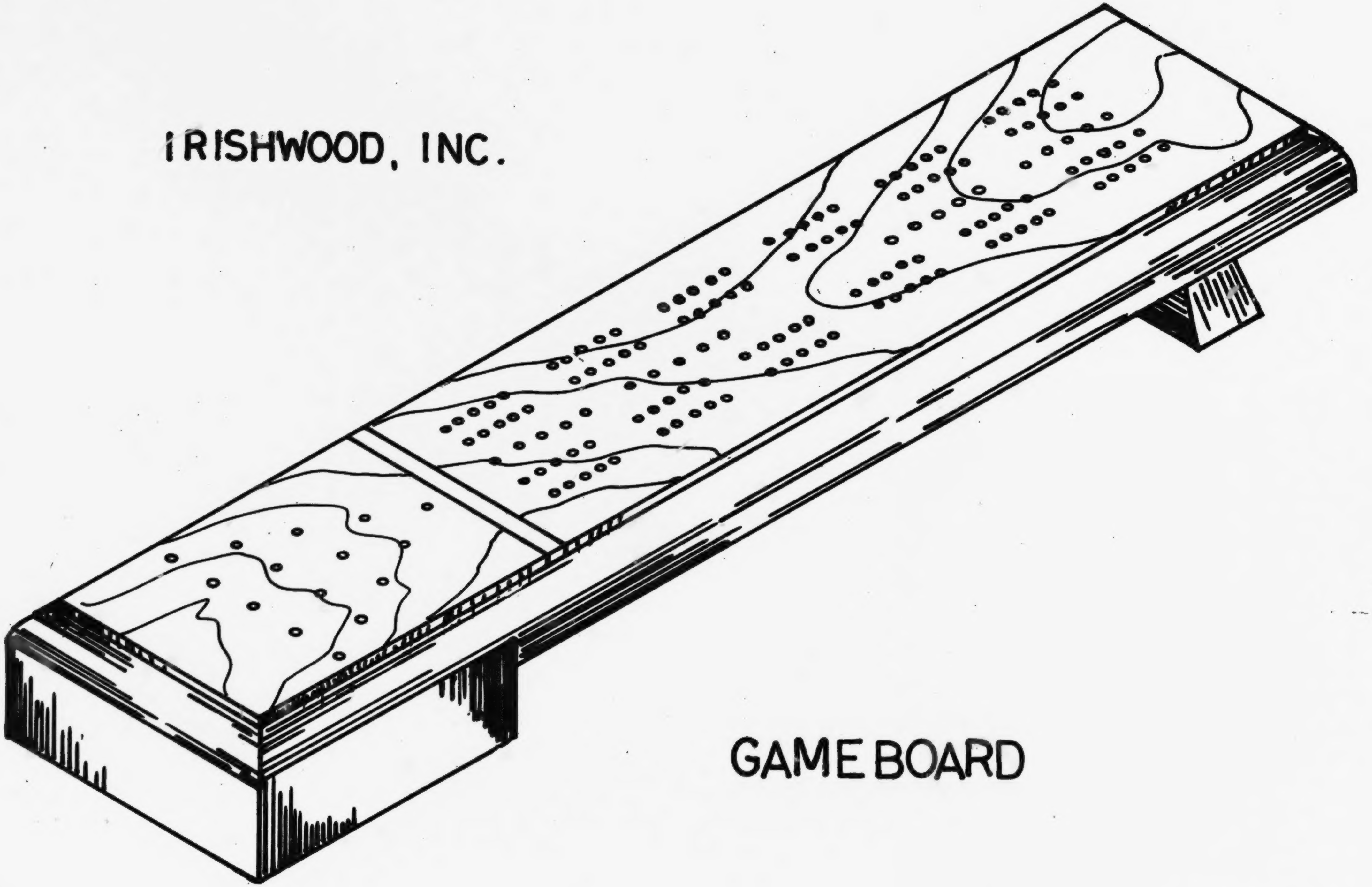
QUANTITY	ONE MAKES		T	W	L	CHECKED
	1=	ROUGH SIZE				
	1=1	FINISHED SIZE				

DETAILS

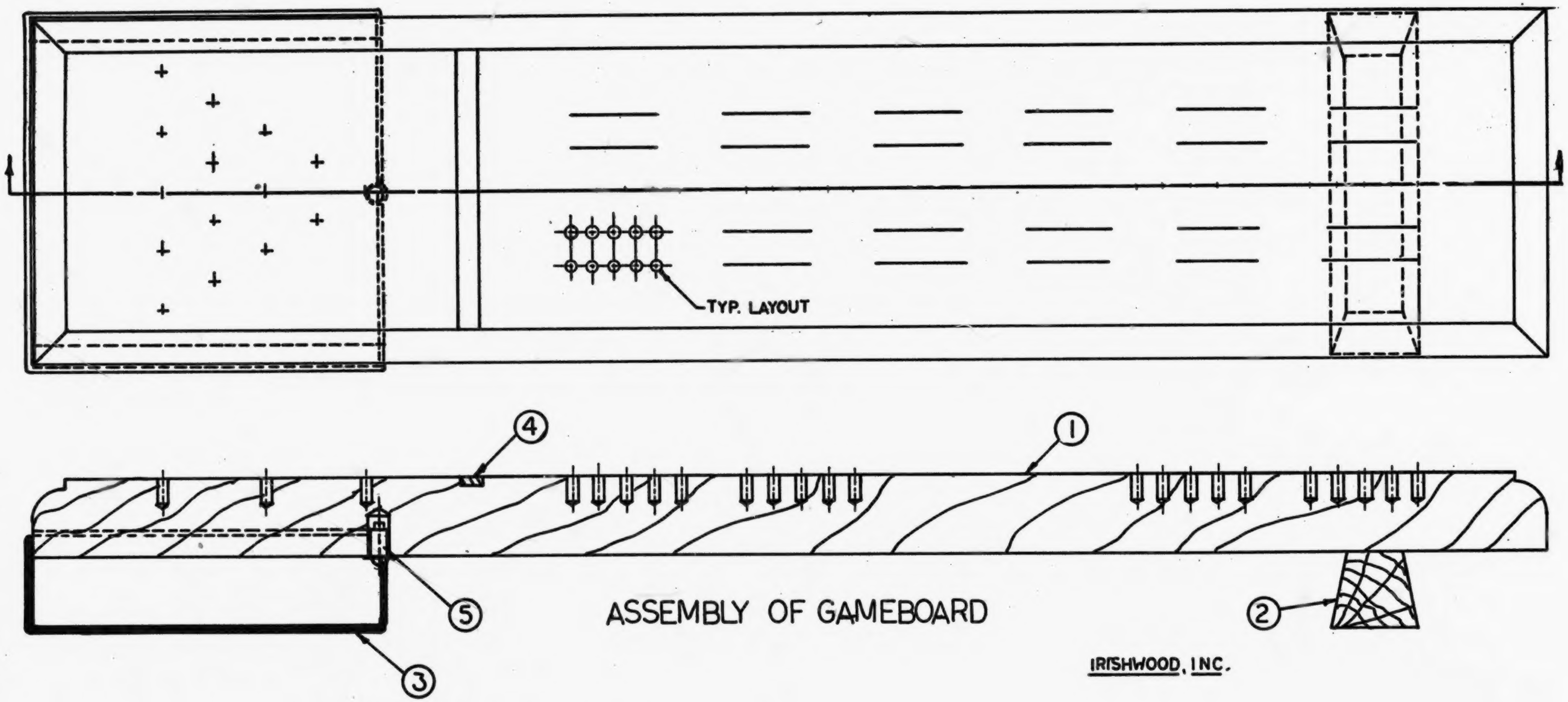
OPERATION	CHECKED BY

JOB TICKET

IRISHWOOD, INC.



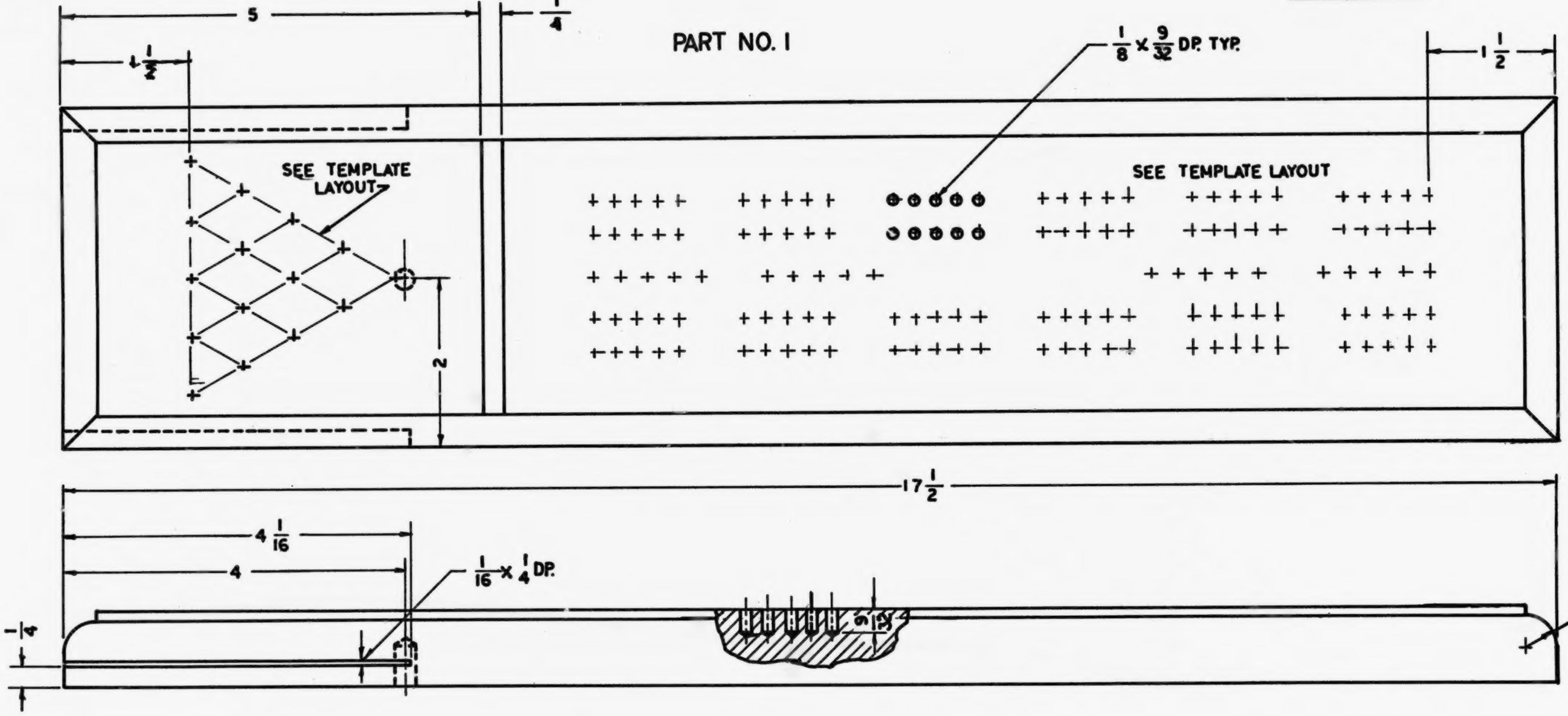
GAMEBOARD


TYP. LAYOUT
①
②
③
④
⑤

ASSEMBLY OF GAMEBOARD

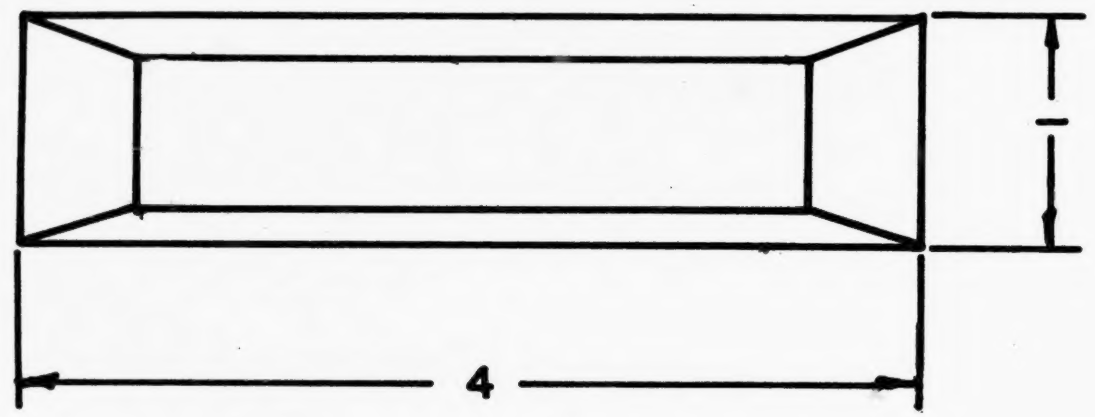
IRISHWOOD, INC.

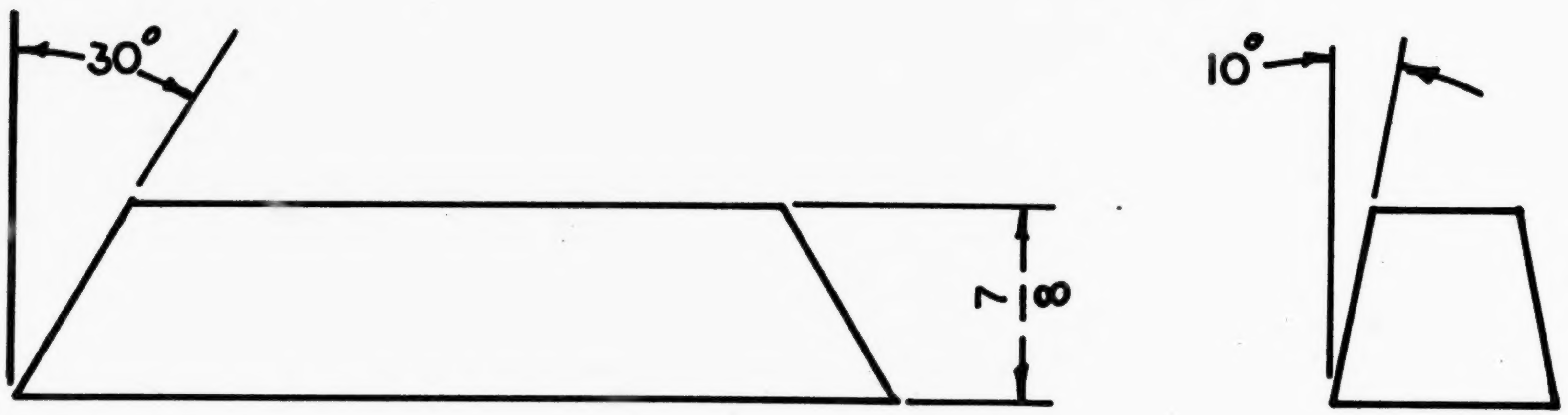
IRISHWOOD, INC.

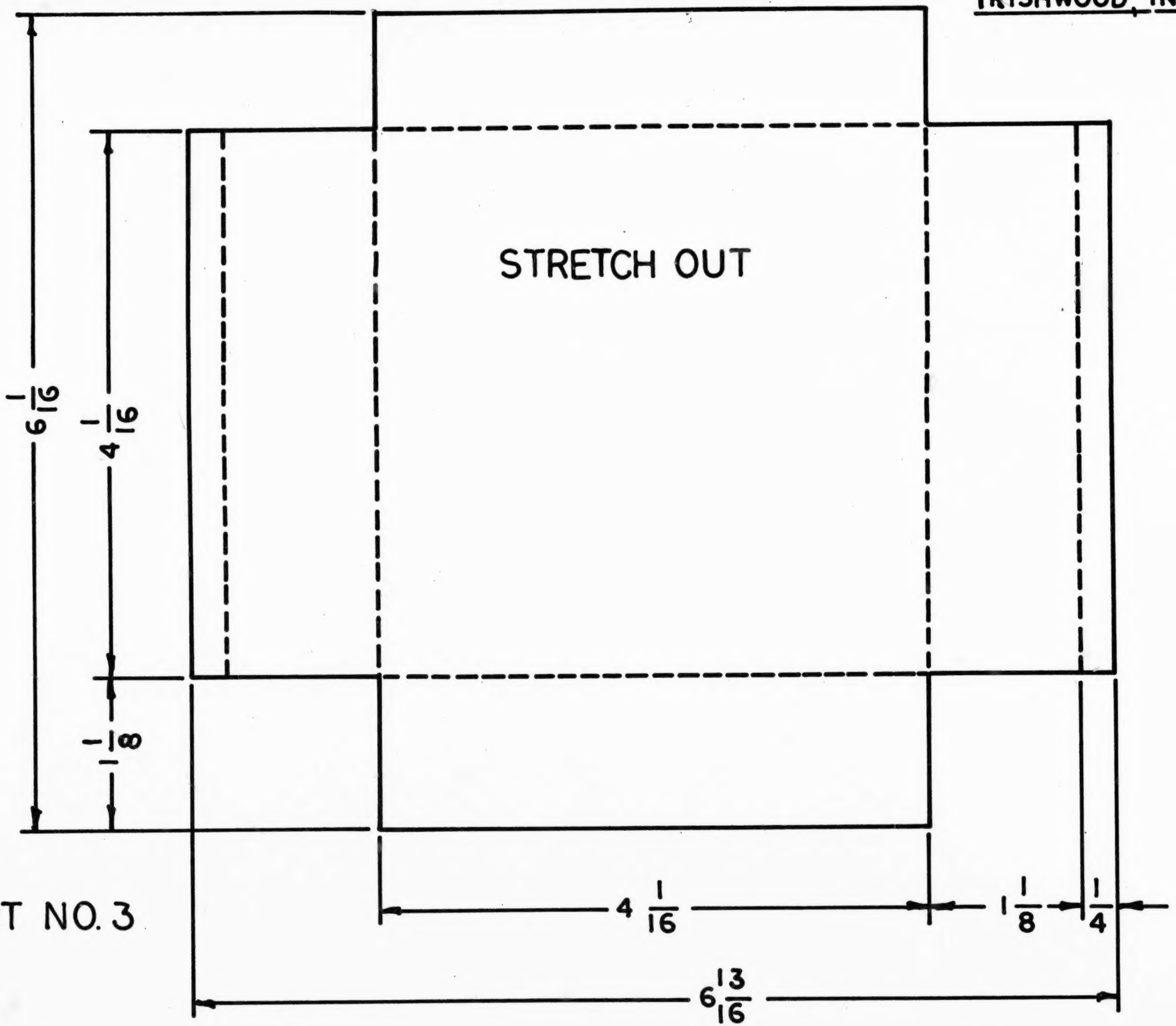

PART NO. 1
5
1/4
1 1/2
1 1/2
1/8 x 9/32 DP. TYP.
SEE TEMPLATE LAYOUT
SEE TEMPLATE LAYOUT
2
17 1/2
4 1/16
4
1/16 x 1/4 DP.
1/4
3/8 R

IRISHWOOD, INC.

PART NO. 2






STRETCH OUT
6 1/16
4 1/16
1 1/8
4 1/16
1 1/8
1/4
6 13/16

PART NO. 3

Play Cribbage!   O Play the new Peg Game!

Mahogany Cribbage Board
and
Peg Game Set

Irishwood Inc.   1968

TOOLS AND EQUIPMENT:

No special tools or machines are necessary beyond the usual equipment of an industrial arts laboratory.

MATERIALS AND SUPPLIES:

1. Mahogany lumber
2. Maple lumber
3. Aluminum punched sheet stock
4. Brass brazing rod - 1/8" diameter
5. Molded plastic pegs
6. Wire brads - 1¼" - #16
7. Glue (white)
8. Bulls eye catch - ¼" diameter
9. Penetrating wood sealer
10. Steel wool
11. Garnet finishing paper
12. Aluminum oxide machine belts (abrasive)

JIGS AND FIXTURES:

1. Hole template for cribbage board

2. Hole template for peg game

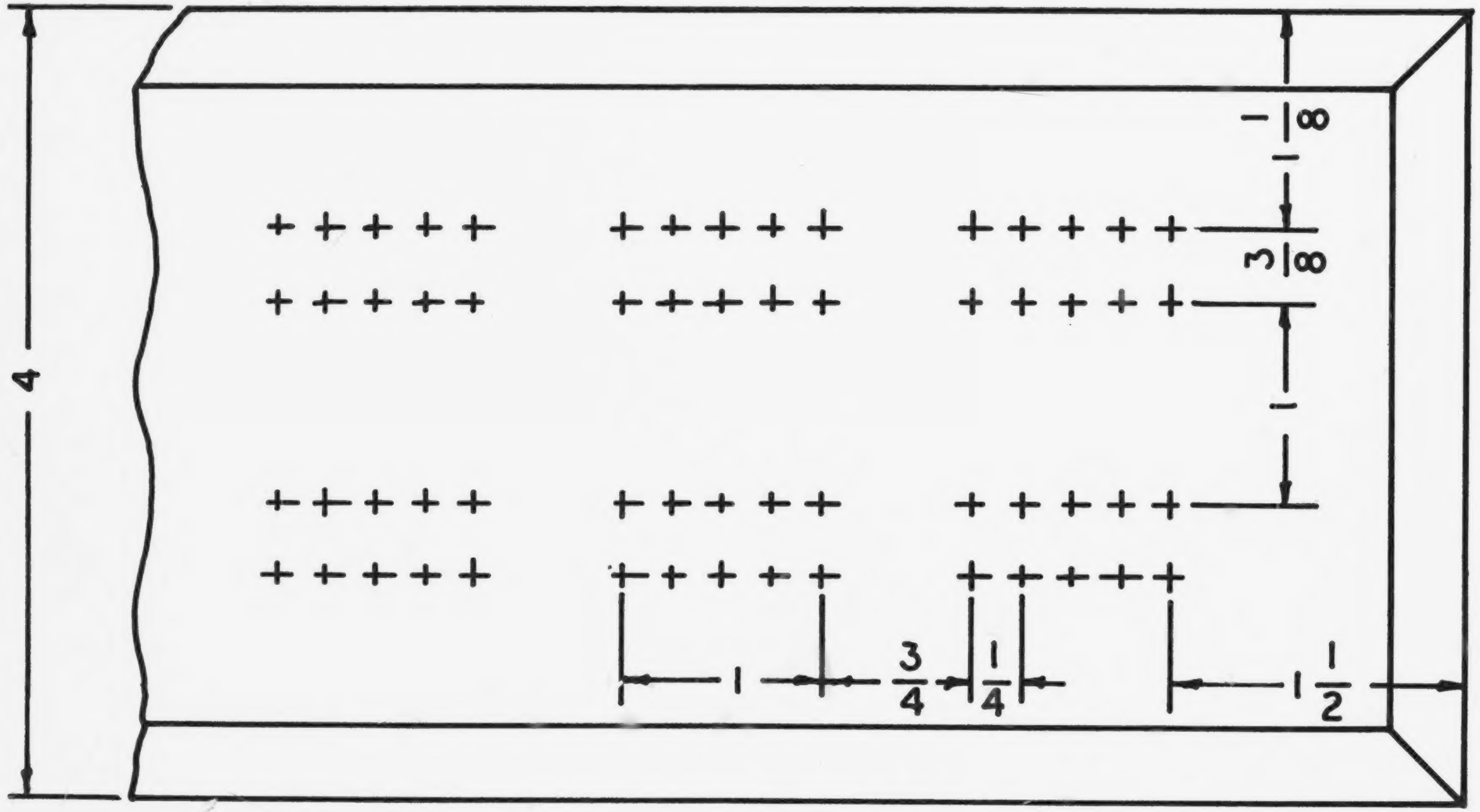
3. Jig for placing hole in bottom of board

    a. Mark and bore
    b. Place jig on table of drill press - for bullet catch

4. Jig for boring holes in leg

5. Stop blocks used on circular saw fence

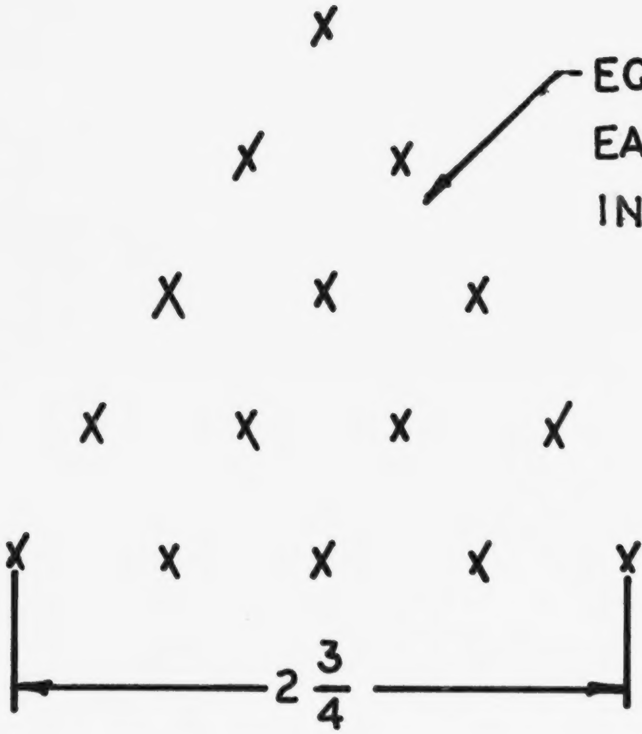
6. Jig for assembling leg


1/8
3/8
1
4
1
3/4
1/4
1 1/2

LAYOUT FOR THE CRIBBAGE GAME ON PART NO. 1

ONE HALF PLAN

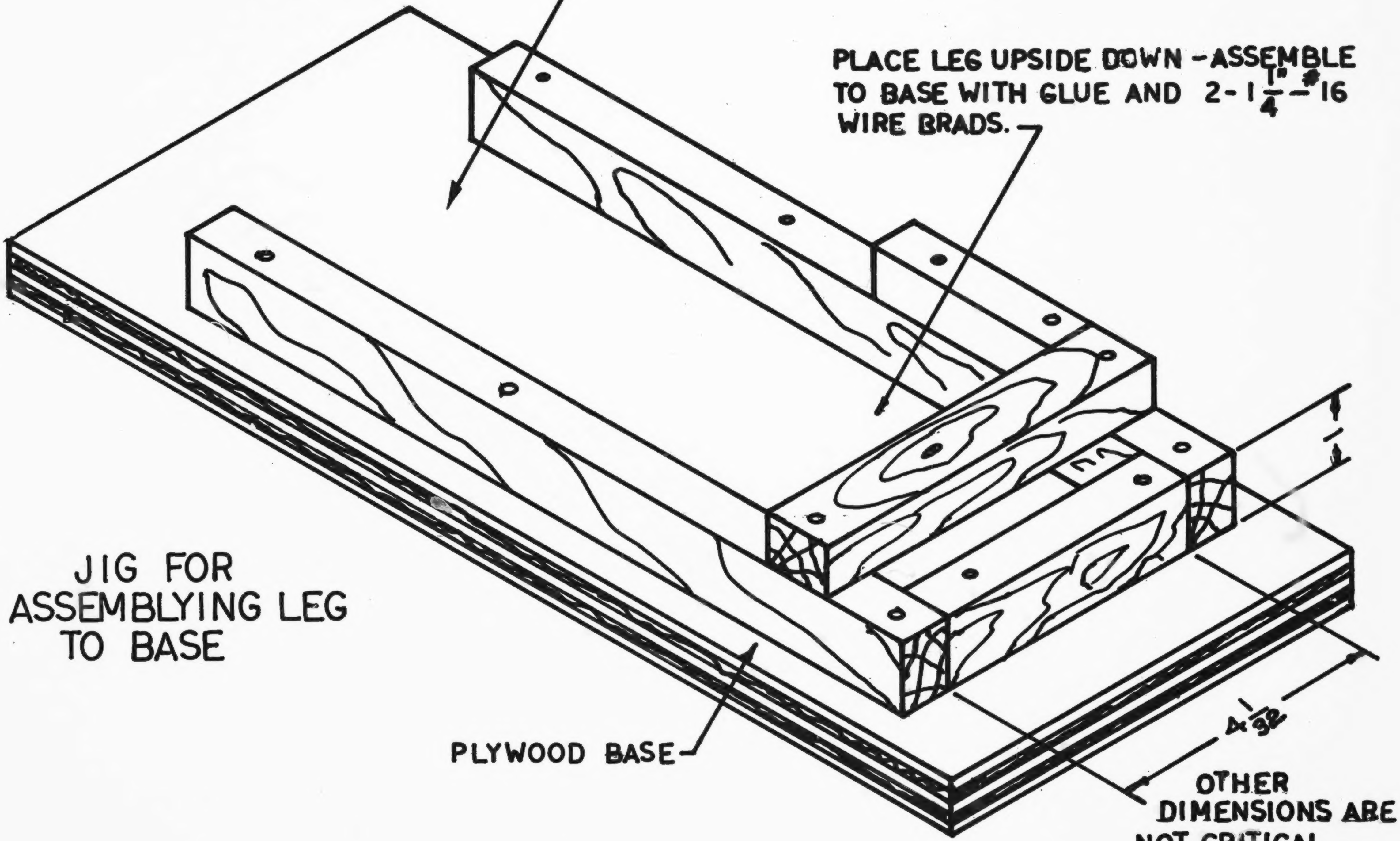
IRISHWOOD, INC.


X
X X
X X X
X X X X
X X X X X
2 3/4

EQUILATERAL TRIANGLE
EACH SIDE TO BE DIVIDED
INTO 5 EQUAL PARTS

LAYOUT FOR THE PEG GAME ON PART NO. 1

IRISHWOOD, INC.


1
$4\frac{1}{32}$
PLYWOOD BASE

PLACE BASE UPSIDE DOWN HERE
CRIBBAGE BOARD END INTO JIG

PLACE LEG UPSIDE DOWN - ASSEMBLE
TO BASE WITH GLUE AND 2-1$\frac{1''}{4}$-#16
WIRE BRADS.

OTHER
DIMENSIONS ARE
NOT CRITICAL

JIG FOR
ASSEMBLYING LEG
TO BASE

LESSONS TO BE TAUGHT:

Toys and Games in Personal Development and Economy

Ownership of Industrial Enterprise

Introduction to Mass Production

Elements of Design

Selecting a Product to Manufacture

Make a Working Sketch

Analyze Sketches for Materials Required

Process Engineering

Selection of Stock

Using the Layout Tools

How Cutting Tools Work

Use of Jigs and Fixtures

Forming Tools and Equipment

How to Assembly Manufactured Parts

Surface Preparation for Finishing

Available Finishes and Methods of Application

Inspection Methods

Packaging a Product

Evaluating Products

Industrial Organization

Industrial Personnel and their Responsibilities

Labor Organizations

Safety in the Industrial Arts Laboratory

Review Lesson on Manufacturing - The Seven M's of Manufacturing

Title: Toys and Games in Personal Development and Economy

Presentation:

I. Play, a heritage from ancient man

  A. Simple forms of playthings

    1. Nuts from trees
    2. Sticks
    3. Shells
    4. Multi-colored rocks

  B. Contributed to his development

    1. Observing
    2. Reasoning
    3. Learning

II. Experimentation with his own mechanism

  A. Tested his skill and strength

  B. Matched it with that of his associates

    1. Ran races
    2. Wrestled
    3. Engaged in various types of contests

III. Child's understanding develops slowly

  A. Promoting a new concept of human relationships

    1. Self-control
    2. Assume responsibility
    3. Promote fair play
    4. Reveal good sportsmanship

  B. Developing appreciation of other people

    1. Nations do similar things
    2. Have similar problems
    3. Success of nations
      a. Inventions
      b. Discoveries

  C. The balance of personality

    1. Be able to live with himself
    2. Less dependent on other resources
    3. Make his own work or play

  D. Integrating the individual and society

    1. Develop agility to adjust to varied situations
    2. Directing behavior toward good of a group

IV. Role in our economy

   A. 1962 - $908,000 value of goods produced

   B. 1964 - $1,000,000 value of goods produced

   C. Ranks 49th out of 61 leading industries

References:

Sarah Ethridge Hunt and Ethel Cain, Games the World Around, pp. 2, 10-14

"Games and Sports," Lincoln Library of Essential Information, p. 2089

Title: Ownership of Industrial Enterprises

Presentation:

I. What is ownership?

A. A legal term

B. Commonly means legal title to:

1. A thing
2. Right of possession
3. Control and disposal

C. Applied to industry, it means:

1. Title to possession of
   a. Assets
   b. Power to determine policies of operation
   c. Right to receive and dispose of proceeds

II. Common types of ownership

A. Individual ownership

1. Serves customer
2. Decides policy
3. Manages business
4. Personal capital and loan finance business
5. Liable for all entire business
6. Lends itself to small business

B. Partnership

1. Serves customer
2. Partners agree on policy
3. One or both partners manage
4. Partners own business equally
5. Both equally liable
6. Also lends itself to smaller businesses

C. Corporation

1. Dominates the manufacturing field
2. Legally created business
   a. Owners ore stockholders
   b. Board of directors fix policies
   c. Top ranking officials chosen by directors to manage company

References:

Lawrence L. Bethel, Franklin Atwater, George Smith, Harvey Stackman, Jr., Industrial Organization and Management, pp. 11-14

Title: Introduction to Mass Production

Presentation:

- I. Definition of mass production
  - A. Manufacturing products with many parts in large quantities
- II. Significant contributors to mass production
  - A. Eli Whitney
    - 1. Interchangeable parts
  - B. Henry Ford
    - 1. First mass production factory as we know it today
    - 2. Originated the first moving assembly line
- III. Use in manufacturing as a major manufacturing method
  - A. Parts production
    - 1. Standard interchangeable parts
  - B. Assembly of products
    - 1. Rapidly
    - 2. Accurately
- IV. Effects on society
  - A. More leisure time
  - B. Good quality products
  - C. Lower cost per unit
  - D. Higher wages for worker

References:

Charles Franklin Kettering and Allen Orth, American Battle for Abundance.

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 209-236.

Title: Elements of Design

Presentation:

I. Lines

A. Straight

B. Curved

C. Circular

II. Shape

A. Squares

B. Rectangles

C. Triangles

D. Round

III. Mass

IV. Proportion

A. Golden rule (1.618)

B. Odd ratios are more appealing than even ratios

C. Most appealing

1. Rectangles
2. Ovals
3. Free forms

V. Balance

A. Formal

B. Non-formal

VI. Color

A. One color should be dominant

B. Warm colors

1. Red
2. Orange
3. Yellow

C. Cool colors

   1. Blue
   2. Purple
   3. Green

VII. Texture

A. Condition of the surface of the metal

B. Can be added by

   1. Perforating
   2. Cutting
   3. Pressing
   4. Rolling
   5. Expanding

References:

T. Gardner Boyd, Metalworking, pp. 7-9

Title: Selecting a Product to Manufacture

Presentation:

I. Criteria for selecting a product

A. Commercial value in marketing

1. Quality product will sell itself
2. How many will sell?
3. Need for the product
4. Produce a profit to the company
    a. Desirable to most pupils
    b. Reasonable selling price

B. Design of the product

1. Functional value
    a. Durability
    b. Serve intended purpose
    c. Mechanically sound
2. Decorative value
    a. Beauty - attractive
    b. Personality - different
    c. Uses proper elements of design
3. Economy of material

C. Limitations

1. Size of product
    a. Too small - not worth profits
    b. Too large
        1) Too many processes
        2) More help needed
    c. Storage problems
    d. Distribution problems
        1) Packaging
        2) Cost of transportation
2. Facilities
    a. Available tools and equipment
    b. Production flow
    c. Storage of materials
3. Manpower
4. Time necessary for manufacture
    a. Engineering time
    b. Production time
    c. Marketing time

II. Collection of ideas for a product

A. Brain storm as a group

1. Involve pupil ideas
2. Record ideas on paper or tape
3. Evaluate ideas

B. Assign outside assignment to bring in ideas for a product

1. Pictures and catalogs
2. Models and samples
3. Sketches or drawings
4. Books and magazines
5. Gift lists
6. Visit local stores

C. Company research and development department announce suggestion for a new product

1. Redesign of existing product
    a. Lower production time
    b. Better design - functional, saleable
    c. Produced at lower cost
2. Product designed to use a newly developed material
3. Development of an original idea

D. Demonstrate a need for a product by reminding pupils of underprivileged people

1. Christmas gifts
2. Recreational gifts

III. Methods of selecting a product idea

A. Board of Directors elect

B. Pupils acting as salesmen present their ideas to the company

C. Teacher assists as a consultant to the company

1. Suggest combining ideas of products
2. Refine usable ideas

D. Pupils elect by popular vote

1. Choose 3 in order - First, Second, and Third
2. Give prize or bonus for first choice of idea
3. Elect one product to be manufactured.

References:

Delmar W. Olson, Industrial Arts for the General Shop, pp. 34-39

Title: Make a Working Sketch

Presentation:

I. Define a sketch or preliminary drawing

   A. Graphic communication of ideas

      1. Sketches understood in most any country
      2. Alphabet of 6 lines used compared to 26 letters and complicated grammar in English

   B. Examine a prepared working drawing for details and necessary information

   C. Sketches or preliminary drawings used in industry are called layouts

      1. Skilled draftsmen and technicians make final drawings
      2. Sketches can be used in place of final drawings

II. Equipment needed

   A. Media

      1. Graph paper, tracing paper, drawing paper

   B. Tools

      1. T-square, scale, triangles, compass, templates
      2. Soft and hard pencils, tape, working surface

III. Steps in making free hand or drawing a sketch

   A. Observe the object

      1. Select necessary views to describe
         a. Oblique
         b. Isometric
         c. Orthographic

            1) Two or three views
            2) Section
            3) Auxiliary
            4) Pattern
      2. Judge proportions
      3. Block in enclosing rectangles with light lines
         a. Spacing between views
         b. Scale
      4. Locate and block in details with light lines
      5. Thicken and darken desired lines
      6. Apply dimensions and notes

References:

Thomas E. Franch and Carl L. Svensen, Mechanical Drawing, pp. 33-34

Title: Analyze Sketches for Material Requirements

Presentation:

I. Examine product sketches or drawings

  A. Observe notes

    1. Kinds of materials
    2. Use of stock items

  B. Note single or multiple parts

    1. Number parts if not shown

  C. Notice section drawings and auxiliaries for true shapes

  D. Examine dimensions of detailed parts

II. Fill out bill of material for each part

  A. List part number

  B. List number of pieces which are identical

  C. List name of part

  D. List exact or finished size of part

  E. List kinds of material to be used

  F. List how many finish size pieces will be made from one rough or standard size piece

    1. Observe standard sizes of material
      a. Lumber specifications
      b. Standard sizes of sheet stock
      c. Standard sizes of rods, moldings, etc.
      d. Hardware
    2. Combine rough sizes to list thickness, width and length into most efficient use of standard stock

  G. Calculate required units in the rough

    1. Board feet
    2. Square feet
    3. Cubic feet
    4. Lineal feet
    5. Each
    6. Weight

H. List price per unit

  1. Consult price lists in catalogs
  2. Contact local dealers

I. Calculate cost of part or parts alike

J. List all hardware to be used

  1. Price per unit
  2. Total cost of item

K. Total costs

  1. Total cost of parts
  2. Add 15% of cost of parts for finishing materials, glue and incidental items

III. Make out job tickets from material bill for each different part to be manufactured

A. Fill in part number, name of part, job number and kind of material

B. Fill in product name

C. Fill in rough and finished sizes

D. Sketch or draw any special details necessary in the space provided

  1. Shape of cutters
  2. Details of joints
  3. Location of holes

E. List operations to be performed to the part

F. Persons performing operations or filling out forms, sign in spaces provided.

  1. Check for completion
  2. Inspectors

References:

John Klok, Wood Production and Engineering.

See material bill form and job ticket form included.

Title: Process Engineering

Presentation:

I. Reasons for planning flow of material through production

  A. Organize need for manufacture

    1. Set up tools and equipment necessary
    2. Have workers available
    3. Transfer materials from one location to another
    4. Reduce rejects in the production process

  B. Management can study production processes

    1. Bottlenecks and tie-ups in production
      a. Breakdown of equipment
      b. Work stoppage
      c. Slow processes -- need for additional space and equipment
    2. Cost of production
      a. Time study
      b. Cost of individual production processes
      c. Reduce overhead and waste

II. Methods used to analyze production processes

  A. Employ an Efficiency Engineer

  B. Flow charts

  C. Plant layouts

  D. Exploded pictorials showing processes

  E. Engineering process sheets

III. Methods used to have efficiency in production

  A. Moving materials

    1. Short a distance as possible to cut down time waste
      a. Conveyors
      b. Lifting devices
      c. Trucks and dollies
    2. Location of equipment
      a. Machines
      b. Benches
      c. Spaces for assembly of parts
      d. Inspection stations

B. Stacking materials

1. Place each piece the same way
2. Place in direction needed for next operation
3. Avoid damage in moving
   a. Falling to floor
   b. Scratching from materials and chips between stock

C. Procedure of operations

1. Eliminate difficult machine operations
   a. Correct process before another
   b. System of squaring stock
      1) Thickness
      2) Width
      3) Length
   c. Cutting multiple parts
   d. Cutting and forming before abrading
   e. Sub-assembly of component parts
2. Purpose of job ticket
   a. Indicate completed operations
   b. Indicate processes to follow
   c. Indicate any information about part
      1) Finished and rough sizes
      2) Number of pieces alike
      3) Special details
   d. Signature of employee who completed the operation
   e. Signature or number of inspector

References: Harold T. Amrine, John Ritchey, Oliver Hulley, Manufacturing Organization and Management, pp. 252-276

Title: Selection of Stock

Presentation:

I. Criteria for selecting stock

A. Points to consider

1. Price
2. Size
3. Weight
4. Aesthetic
5. Practical for fabricating
6. Wearability

II. Manufactured materials

A. Storage points for following:

1. Wood
2. Steel metals, etc.
3. Plastics
4. Paper
5. Leather

III. Size requirements

A. Standard sizes of stock

1. Wood
2. Metals
3. Plastic
4. Paper
5. Leather

Make stock to fit in multiples for the least waste

IV. Fabricating materials

A. Factors to consider

1. Texture
2. Warp, wind
3. Color
4. Size
5. Defects
6. Exposure

References:

Gardner Boyd, Metalworking, p. 50

Willis Wagner, Woodworking, pp. 10-13

Title: Using the Layout Tools

Presentation:

I. Definition of layout tools - tools used to measure, transfer measurements, check measurements, and mark

II. Measuring tools

A. Steel tape

1. Blades vary as to widths, markings, color
2. Lengths vary as to the need
3. Quickly gotten out and put away (handy)

B. Bench rule

1. Made of wood or steel
2. Come in lengths of 1', 2', and 3'

C. Zig-zag rule

1. Slow to take out and put away
2. Can be extended straight for 6'

III. Checking tools

A. Framing square

1. Used in construction
2. Consists of blade and tongue

B. Small framing square (same as framing square, except smaller)

C. Tri-square

1. Used for small work
2. Consists of blade and handle

D. Combination square

1. Part of combination square set
2. Can be used for many purposes
    a. Checking squareness
    b. Checking 45° angles
    c. Measuring
    d. Checking levelness
    e. Measuring depth
    f. Scribing

IV. Marking tools

- A. Pencil (use one heavy dark line, rather than two lines)
- B. Scratch awl
  - 1. Is substituted for a pencil
  - 2. Can be used to mark on most materials, except aluminum
- C. Marking gauge
  - 1. Used to mark on wood only
  - 2. Used to mark a line parallel to an edge

V. Transfer of measurement tools

- A. Inside calipers (used to find inside diameters by adjusting and measuring distances between points)
- B. Outside calipers (used to find outside diameters by adjusting and measuring distances between points)
- C. Dividers
  - 1. Used to scratch arcs and circles
  - 2. Used to transfer measurements
- D. Sliding T bevel (used to transfer angles)

References:

T. Gardner Boyd, Metalworking, p. 16.

Willis H. Wagner, Woodworking, pp. 19, 27, 29, 33

Title: How Cutting Tools Work

Presentation:

- I. Definition of cutting
  - A. Slicing material
  - B. Chipping material
  - C. Removing material
- II. Types of cutting tools
  - A. Hand tools
    - 1. Saws
      - a. Use
        - 1) Cutting stock to length
    - 2. Chisels
      - a. Use
        - 1) Cutting ends of pins
    - 3. Planes
      - a. Use
        - 1) Smoothing edges of stock
  - B. Machine Tools
    - 1. Same cutting action
    - 2. Covered by individual instruction
- III. Safety involved
  - A. Personal and group
    - 1. Related to hand tools
    - 2. Related to machine tools

References:

John L. Feirer, Woodworking for Industry, pp. 178-181

Title: Use of Jigs and Fixtures

Presentation:

- I. Definition
  - A. Jig
    - 1. Holds work and guides the tool to it
  - B. Fixture
    - 1. A holding device
- II. Purpose
  - A. To produce precision interchangeable parts
  - B. Essential in the mass production of products
- III. Use
  - A. First used by Eli Whitney
  - B. In parts manufacture and assembly
  - C. Results in parts fitting together perfectly in assembly of products
  - D. Manufacture standard replacement parts on products needing repair
  - E. On all types tools, machines, and equipment used in production work

References:

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 214-217.

Title: Forming Tools and Equipment

Forming tools are hand or machine tools that give sheet material three-dimensional shape and rigidity by bending, hammering, and/or rolling.

Presentation:

I. Types of forming tools
    A. Bar folder
    B. Brake
    C. Roll former
    D. Anvil
    E. Hammer
    F. Stake
    G. Vise

II. Changes that can be made using these
    A. Angles
        1. 180° to limitation of brake or bar folder
    B. Bends
        1. Arcs
        2. Circles limited to roll size

III. Materials used in forming
    A. Iron
    B. Aluminum
    C. Copper
    D. Brass
    E. Stainless
    F. Tin

IV. Procedure in forming rectangular shape
    A. Break slide hem or seam

B. Break ends - 90° angle

C. Break sides - 90° angle

D. Assemble

References:

John Feirer and John Lindbeck, I. A. Metalwork, p. 80

Oswald Ludwig, Metalwork, p. 261

John Walker, Modern Metalworking, pp. 19-11

Title: How to Assemble Manufactured Parts

Presentation:

I. Using fasteners

A. Nails

1. Common
2. Box
3. Finish
    a. Procedure
        1) Drive with claw hammer
        2) Drill hole or nail into stock

B. Screws (slotted and phillips)

1. Round head
2. Flat head
3. Oval head
    a. Procedure
        1) Drill holes
            a) Pilot
            b) Shank
            c. Countersink or bore
        2) Drive screw with screwdriver

II. Using adhesives

A. Glue

1. White liquid

B. Cement

1. Contact
2. Plastic

C. Procedure

1. Apply to surfaces
    a. Squeeze on
    b. Brush on
    c. Rub on
2. Secure pieces
    a. Clamping
    b. Weight

References:

Delmar W. Olson, Woods and Woodworking for I. A., pp. 91-101

Title: Surface Preparation for Finishing

Presentation:

I. Inspect surface condition for a specified finish on wood

   A. A good quality surface results in a good finish

      1. Quality of surface for painting
      2. Quality of surface for stains
      3. Quality of surface for natural finish

   B. Check for glue deposits

      1. Around joints
      2. Spills and finger prints

   C. Check for pencil marks and soiled spots

   D. Inspect edges, ends, surfaces, end grain of lumber

      1. Chips and dents
      2. Holes and cracks
      3. Test by observation, looking toward light for machine marks
      4. Scratches form small particles between pieces

II. Condition the surface for quality desired

   A. Remove machine marks

      1. Saw tooth cutting marks from circular saw
      2. Machine marks from jointer and planer
      3. Saw machines marks from band and scroll saw
      4. Wood burrs from drilling

   B. Remove all traces of glue

   C. Set nails below the surface

   D. Fill holes and cracks with desired fillers - either before or after finish is applied

   E. Round or break all sharp edges to prevent finish from wearing off

   F. Final hand sanding

G. Remove dust particles

1. Air blast
2. Vacuum cleaner
3. Moist cloth

References:

John L. Feirer, Industrial Arts Woodworking, p. 168

Willis H. Wagner, Woodworking, p. 51

Title: Available Finishes and Methods of Application

Presentation:

I. Types of finishes and their solvents

  A. Paint

    1. Water base - water
    2. Oil base - turpentine - paint thinner

  B. Varnish - turpentine

  C. Shellac - alcohol

  D. Lacquer - lacquer thinner

II. Methods of application

  A. Brushing

  B. Rubbing

  C. Spraying

  D. Dipping

III. Procedure

  A. Apply desired number of coats

  B. Allow sufficient drying time between each coat

  C. Rub down or sand each coat, depending on finish

  D. Clean application equipment after each coat

References:

John L. Feirer, Woodworking for Industry, pp. 589-608

Title: Inspection Methods

Presentation:

I. Introduction

   A. Done individually by all every day (judge consumer products)

      1. Things we buy
      2. Things we eat
      3. Services performed for us

II. Definition - to look over critically; view carefully or closely

III. Industrial inspection

   A. Purchased material inspection

   B. In-process inspection

      1. Informal (done by worker)
      2. Formal (done by inspectors)
         a. How?
            1) Visually
            2) By jigs
            3) Tools designed for this purpose
         b. Where?
            1) On the line (full time)
            2) At the machine
            3) Roving or partial inspection

   C. Final inspection

IV. Why inspect?

   A. More uniform product

   B. Catch errors

   C. Saves materials and labor costs

   D. Improves relation with customers

   E. Points out trouble spots

References:

Harold T. Amrine and others, Manufacturing Organization and Management, p. 277-291

Title: Packaging a Product

Presentation:

I. Purpose of packaging

  A. Protects product

    1. During shipping and selling

  B. A method of advertising

    1. To attract the customer

II. Types of packages

  A. Boxes

    1. Paper
    2. Cardboard
    3. Metal
    4. Plastic

  B. Bags

    1. Paper
    2. Plastic
    3. Cellophane

  C. Jars

    1. Glass
    2. Plastic

  D. Bottles

    1. Glass
    2. Plastic

  E. Cartons

    1. Paper
    2. Plastic

  F. Crates

    1. Wood and metal
      a. Used usually for large and heavy products

III. Packaging process

   A. By hand

   B. By machine

References:

Lawrence L. Bethel, Franklin S. Atwater, George H. E. Smith, Harvey A. Stackman, Jr., _Industrial Organization and Management_, pp. 276-278

Title: Evaluating Products

Presentation:

- I. Comparison of well made products to inferior ones
    - A. Prices
    - B. Materials
    - C. Construction
    - D. Operation
- II. Consumer value of a product
    - A. Quality of finsih
    - B. Practicality of product
    - C. Functional aspect
    - D. Duration of usefulness
    - E. Workmanship and design
- III. Perform inspection of parts
    - A. Check for correct measurements
    - B. Check for proper fit of parts
    - C. Check for finish of parts
    - D. Final inspection of finished product

References:

Consumers Union, *Consumer Reports*, pp. 4-7.

Title: Industrial Organization

Presentation:

I. Importance of organization

  A. Coordinates all phases of the functions of industry

    1. Stockholders to workers

II. Typical corporate organization (line and staff)

  A. Owners of the company

    1. Stockholders

  B. Owners representatives (administrators)

    1. Board of directors

  C. Executives

    1. V. P. Finance
    2. V. P. Engineering
    3. V. P. Manufacturing
    4. V. P. Personnel
    5. V. P. Marketing

  D. Middle management

    1. Managers and superintendents

  E. Supervisors

    1. Assembly
    2. Parts manufacture
    3. Quality control

  F. Section of line chiefs

  G. Foremen

    1. One each shift

  H. Workers

III. Organization in Industrial Arts laboratory

- A. Need same as in industry
- B. Set up a type of line and staff pupil personnel organization
  - 1. Elect personnel or have them apply for management jobs in organization
    - a. Job qualifications
    - b. Responsibility of specific jobs

References:

Lawrence L. Bethel, Franklin Atwater, George Smith, Harvey Stackman, Jr., Industrial Organization and Management, pp. 36-47

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 226-227.

Title: Industrial Personnel and their Responsibilities

All pupils have at one time or another taken leadership roles in the ordinary types of games and activities we usually play in our routine day to day living. Many have had experiences of losing if the leadership is not capable. After completing this lesson, we hope the pupil will accept a position in the company according to his potential.

Presentation:

I. Leadership

  A. Types

    1. Captain
    2. Foreman
    3. Head of Department
    4. Group leader
    5. Father, Mother

II. Assignment according to pupil interest

  A. Plant Superintendent

    1. Oversees entire personnel system
    2. Checks attendance
    3. Calls attention of foremen to close of period
    4. Reports to instructor

  B. Research and industrial relations

    1. Keeps research and planning materials and facilities in order
    2. Provides public relations through bulletin boards and literature

  C. Industrial Engineer

    1. Checks all tools at the end of period and reports to the superintendent
    2. Inspects machinery and accessory panels
    3. Keeps tool boards and cabinets in good order

  D. Maintenance Foreman

    1. Oversees all maintenance personnel
    2. Makes substitutions for absent members
    3. Reports to superintendent when machines are inoperative

E. Safety Engineer

1. Keeps a check on first-aid supplies
2. Reports any injury to the instructor immediately
3. Checks conditions of tool and equipment and reports safety hazards

References:

Association of Consulting Managements Engineers, Inc., Common Body of Knowledge for Management Consultants.

Donald E. Cook, Marvels of American Industries, pp. 261-64

Carl Gerbracht, Frank Robinson, William Hanks, Understanding America's Industries, p. 230.

Robert Haws, Manufacturing in the School Shop, pp. 37-38.

Gordon Wilber, Norman Pendered, Industrial Arts in General Education, p. 211.

Title: Labor Organizations

Presentation:

I. Definition of labor unions (groups of employees organized to promote a common interest)

II. Terms of labor unions

  A. Strike - when workers stop working to get management or owners to meet demands

  B. Picketing - method used to get other union members to do business with management of the company being picketed, usually carrying picket signs

  C. Boycott - union members and others do not buy certain products

  D. Management - owners, employers

  E. Labor - people who do the work (production) employees

III. Types of unions

  A. Craft unions (workers of a single craft - painters, plumbers, carpenters)

  B. Industrial unions (workers in a single plant or industry)

IV. History of union in America

  A. Many organized in latter 1700's (1792-1810)

  B. American Federation of Labor started in 1886 (Samuel Compers)

  C. Congress of Industrial Organization - 1938 (John L. Lewis)

  D. Merger of AFL-CIO (1955)

V. Advantages of unions

  A. For labor (employees)

    1. To increase wages
    2. Fringe benefits
    3. Shorter hours
    4. Better working conditions
    5. Security

B. For management (employers)

1. To be able to negotiate with labor as one group
2. To be able to have certain standards of production and wages which both management and labor agree on

VI. Disadvantages of unions

A. Cause of loss to employers

B. Cause of loss of income to employees during a strike

C. Cause of loss of services to the public (telephone strike)

References:

"Labor Relations," *The Lincoln Library of Essential Information*, pp. 1225-33, 22nd edition

Title: The Seven M's of Manufacturing

Presentation:

I. Introduction

- A. Many people find modern manufacturing too difficult to understand
- B. Approximately 80% of high school graduates will be involved in manufacturing to earn their livelihood

II. Money

- A. Needed to buy machines, buildings, materials
- B. Can be obtained from individuals, banks government and selling of stock

III. Machines

- A. Machines do work faster and more accurately than hand methods
- B. Must be up-to-date to compete with others

IV. Materials

- A. Raw materials should be close to the industry
- B. Must be at the right place at the right time

V. Methods

- A. Products must be turned out fast, at a low cost, with quality

VI. Markets

- A. Advantage to be close to the industry
- B. Items that appear on the market must be saleable

VII. Men

- A. People who work in industry, both management and labor
- B. Jobs may change, but men will still be needed

VIII. Management

  A. Key to the success of the industry

  B. If the pilot fails, the plane fails

IX. Review points covered

References:

Harold T. Amrine and others, *Manufacturing Organization and Management*, p. 7

Robert W. Haws and Carl J. Schaefer, *Manufacturing in the School Shop*, p. 4

Note: A jet plane (Northeast Yellowbird model) was used to illustrate, summarize and compare the seven functions of manufacturing, as follows:

Money...............Engines
Machines............Wings
Materials...........Stabilizer
Methods.............Tail fins
Markets.............Tail fins
Men.................Fuselage
Management..........Pilot

ASSIGNMENT

Name________________________________

Define the terms below:

A game (indoor or outdoor)____

____

____

A toy____

____

____

On the space below or the attached sheet, describe an idea for a game or toy which you think the class would like to manufacture. Plan to try to sell your idea to the others in the class, by using a picture, a rough sketch, a sample or by demonstration of an original game or toy.

If your game or toy is selected, you will receive a special bonus.

A good game or toy product should have commercial value, be interesting enough to others to sell itself, and be within the capacity of the laboratory. The product should involve two or more materials.

UNIT EVALUATION:

Multiple Choice: To the left of each statement, place the letter that best completes the statement correctly.

Example:

b On a clear, sunny day, the sky is (a) green, (b) blue, (c) pink, (d) brown.

---

b In preparing a product for the finishing operations, glue deposits may be (a) left on the material, (b) sliced off and material sanded, (c) sanded lightly, (d) covered up with stain.

c Sharp edges on a product as a result of tool and machine operations should be (a) left as they are, (b) sanded off by belt sander, (c) slightly rounded by hand sanding, (d) cut off with a wood chisel.

d A job ticket contains information for (a) a new job for workers, (b) job analysis, (c) tools for the job (d) a description of a single part of a product and the operations to be performed.

c The best form for presenting information of a new idea would be (a) a photograph, (b) a composition, (c) a working sketch, (d) a complete set of drawings of all the detailed parts.

c Material bills should be filled out (a) after the product has been completed, (b) as the pieces of material are cut to shape, (c) after working sketches are approved, (d) to keep track of the parts as they are assembled.

c A device used in production work to hold the work and guide the tool is called a (a) clamp, (b) fixture, (c) jig, (d) holding device.

d Credit for the first mass production factory as we know it today is given to (a) Oliver Evans, (b) Eli Whitney, (c) John Pontiac, (d) Henry Ford.

b Ownership is a (a) false, (b) legal, (c) labor, (d) illegal term.

a Which of the following would be the administrators of a corporation: (a) board of directors, (b) V.P. of marketing, (c) supervisors, (d) workers.

d What is not considered necessary when selecting stock for indoor games and toys? (a) color,(b) defects, (c) size, (d) exposure d Which one of the following is not a purpose for inspection? (a) for a more uniform product, (b) to catch errors, (c) to save material, (d) to increase the cost.

d Which one of the following is not a cutting tool? (a) cross cut saw, (b) flat chisel, (c) block plane, (d) claw hammer.

c Which of the following are types of fasteners? (a) finsih nails, (b) flat head wood screws, (d) contact cement (c) all of these.

d Which of the following are methods of applying a finish? (a) rubbing on, (b) spraying, (c) dipping, (d) all of these.

b Which of the following is a condition of the surface material? (a) color, (b) texture, (c) shape, (d) balance.

d Which of the following concepts deal with human relationships? (a) self control, (b) promote fair play, (c) reveal good sportsmanship, (d) all of these.

b Which of the following tools is used to scratch arcs and circles? (a) sliding T-bevel, (b) dividers, (c) inside caliper, (d) hammer.

a The department in industry that deals with designing and planning is (a) engineering, (b) production, (c) marketing, (d) management.

a A machine that is not used for cutting is the (a) pan brake, (b) shears, (c) notcher, (d) snips.

Completion: Directions: Place the correct word or words on the line required. Each correct answer is worth one point. The first is done for you.

Example: The color of snow is (white) .

1. A tool used to layout materials at right angles and for marking parallel lines is called (combination square) .

2. A flow chart would be worked out with the (engineering) department.

3. If the product you are making is two feet long, you should buy materials in multiples of (2) or (4) feet.

4. Chisels remove materials by (slicing) away.

5. Before using a screw to fasten a (pilot), (shank), and (countersink (bore)) must be drilled.

6. Alcohol is used as a thinner for (shellac).

7. The Seven M's of Manufacturing are:
(Men) (Management) (Markets)
(Methods) (Money)
(Materials) (Methods)

8. What is the key to the success of any industry? (Management)

9. Why would it be advantageous to an industry to be located close to the supply of raw materials? (Cut shipping costs)

10. What might be some sources of money to start a company?
(Banks) (Government) (Sell shares of stock)

11. Approximately what percent of the high school graduates of today will earn their living with occupations involved in manufacturing?
(80%)

12. What are three proper tools to be used to mark on materials?
(Scratch awl) (Pencil) (Knife)

13. Man needed to experiment with (games) to improve his skills and strengths.

14. A reason for packaging a product would be to (protect it).

15. Three types of packages for manufactured products would be:
(boxes) (bags) (jars)

16. Manufacturing products with many parts in large quantities is referrred to as (mass production).

17. The owners of a corporation are called (stockholders).

18. Three common types of ownership found in industrial enterprises are (single ownership), (partnership), (corporation)

19. A holding device used in production work is referred to as a (fixture).

20. Production engineers decide and make up (flow) charts and diagrams to organize the production process.

True or False

Circle the correct letter in space provided.

T F People in leadership positions should assume less responsibility.

T F Shape is a factor to consider when ordering materials.

T F Aviations snips are designed to cut sheet metal.

T F The games and toys industry produces over one billion dollars worth of goods yearly.

T F Some inspection is done by each of us daily.

T F Informal inspection is done by each worker.

T F Cutting may be defined as the chipping away of material.

T F Screws have greater holding power than nails.

T F Oil base paint is thinned with water.

T F A combination square would be a useful square in the home.

T F An advantage of steel tapes is they come in long lengths.

T F We have learned to play from ancient man.

T F Mass production is a major method of manufacturing.

T F Organization is an essential part of the industrial arts laboratory.

T F Partnerships are the most common types of industrial ownership.

T F Eli Whitney was the early pioneer in the use of jigs and fixtures.

T F Brainstorming is a good way to find new product ideas.

T F A new product should be considered for functional value as well as appearance.

T F A flow chart is designed to show the manufacturing process to visitors.

T F Fixtures are used to guide a tool in duplicate production.

Matching Test:

Directions: Place the letter of the word in the right column, in the space provided, next to the phrases in the left column which it matches. The example is done for you.

Example: _a_ Part of an apple a. seed

The following deal with unions:

___ Workers stop work for better conditions
___ People who produce the product for a company
___ People who run the company
___ When people carry signs to prevent business
___ When people won't buy a certain product
___ An organization of workers

a. strike
b. union
c. picketing
d. boycott
e. management
f. labor
g. scab
h. closed shop

The following deal with tools and tool processes:

___ Laying out for holes
___ Cutting wood off to length
___ Making a 5/16" hole in metal
___ Prepare surface for finishing
___ Making interchangeable parts

a. prick punch
b. jib
c. abrasive
d. drill
e. crosscut saw
f. center punch
g. compass saw
h. bit

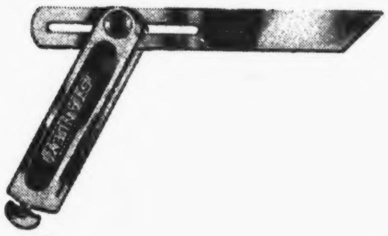
The following deal with industrial terms:

___ Ownership by two or more people
___ Manufacturing products in large quantities
___ Inspection of products
___ Concentration on one skill area
___ Ownership by stockholders

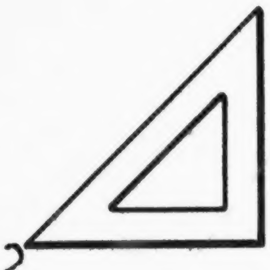
a. Partnership
b. Corporation
c. Mass production
d. Quality control
e. Line production
f. Single ownership
g. Specialization
h. Individual proprietorship

TOOL IDENTIFICATION

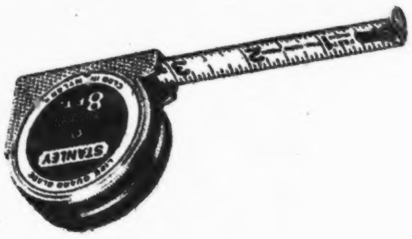
Directions: Place the correct name of the tool on the blank provided below each picture. The example is done for you.



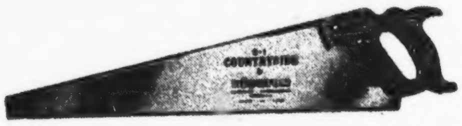
1. ________________



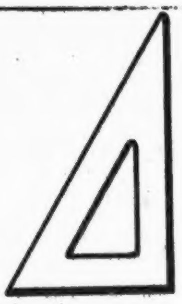
2. ________________


STANLEY
8 ft

3. ________________



4 ________________



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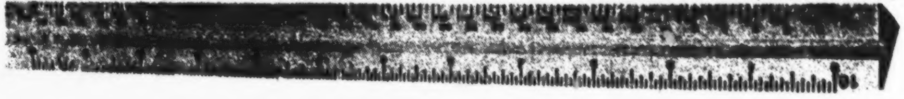

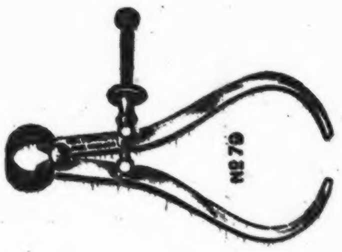

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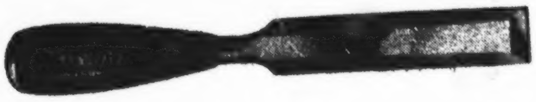

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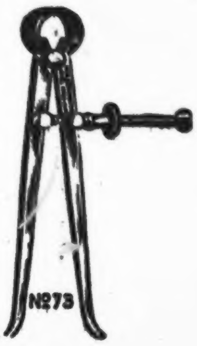

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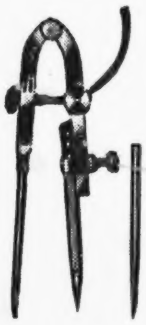
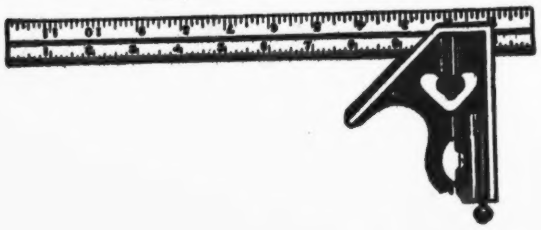
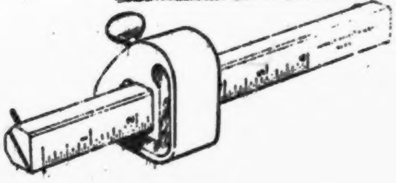
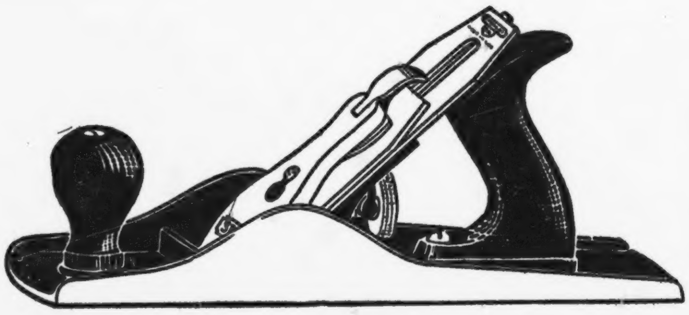


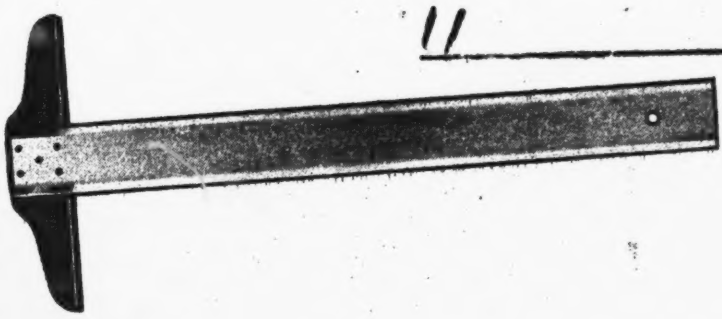




7 ________________

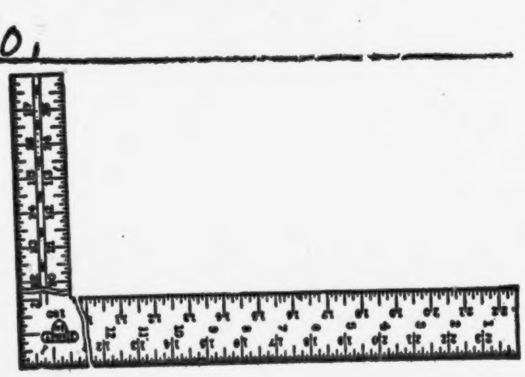
11 ________________

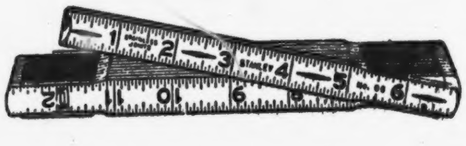


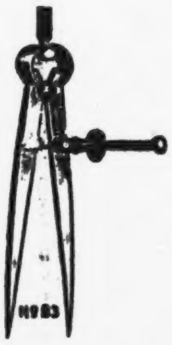


10, ________________

12 ________________







14 ________________

15 ________________

13 ________________

August 2, 1968

GAME BOARD by Irishwood, Inc.

At one end, a peg game will be found which tests your ability to forsee the next move. The object of the game is to start with one hole open, then jump and remove pegs until all but one peg is left. Another test would be to end the remaining peg in the open starting hole.

At the other end, you have the conventional cribbage game scoreboard. Cribbage is an exciting game which can be played by 2, 3 or 4 players. The board is used to keep score by moving the rear peg ahead of the other for the number of points gained. Pegs are moved up the outside and down the inside and then repeated to make a total of 120 points, plus one for pegging out of the game.

The aluminum box holds a deck of cards and the pegs.

The person sitting clockwide to the dealer has first count. For further instructions, see a game book or someone who can play the game.

Scoring Points

Within counting limit of 31 points	Reason for points	Points in Hand	In Crib
2	Pairs	2	2
6	Triplets	6	6
12	Fours	12	12
2	Each 15	2	2
3	3 cards in sequence 9 (called a run)	3	3
1	Each additional card in sequence	1	1
	Double run of 3 cards (two runs of 3 and 1 pair)	8	8
	Double run of 4 cards (2 runs of four and 1 pair)	[illegible]	10
	Triple run - Triplets and two other cards in sequence. For triplets and 9 for three card runs	15	15
	Quadruple run - 2 pairs and a card in sequence. Four 3-card runs, 12; and 2 pair for 4	16	16
	4 cards in hand - 1 suit	4	No score
	4 cards in hand - 1 suit and "Starter" same suit	5	5
	Jack held in hand or Crib which is same suit as "Starter"	1	1

(Continued)

While setting down cards: 2 for 15 points
2 for 31 points
1 for go or last card, if not exactly 31

Starter jack turned up by dealer on cut - 2 points

2 players deal 6 cards - 4 for hand, 2 for Dealer's Crib
4 players deal 5 cards - 4 for hand, 1 for Dealer's Crib
3 players deal 5 cards - 4 for hand, 1 for Dealer's Crib, plus 1 from the deck

W. C. Horn Brothers and Company, Newark, New Jersey - New York, New York